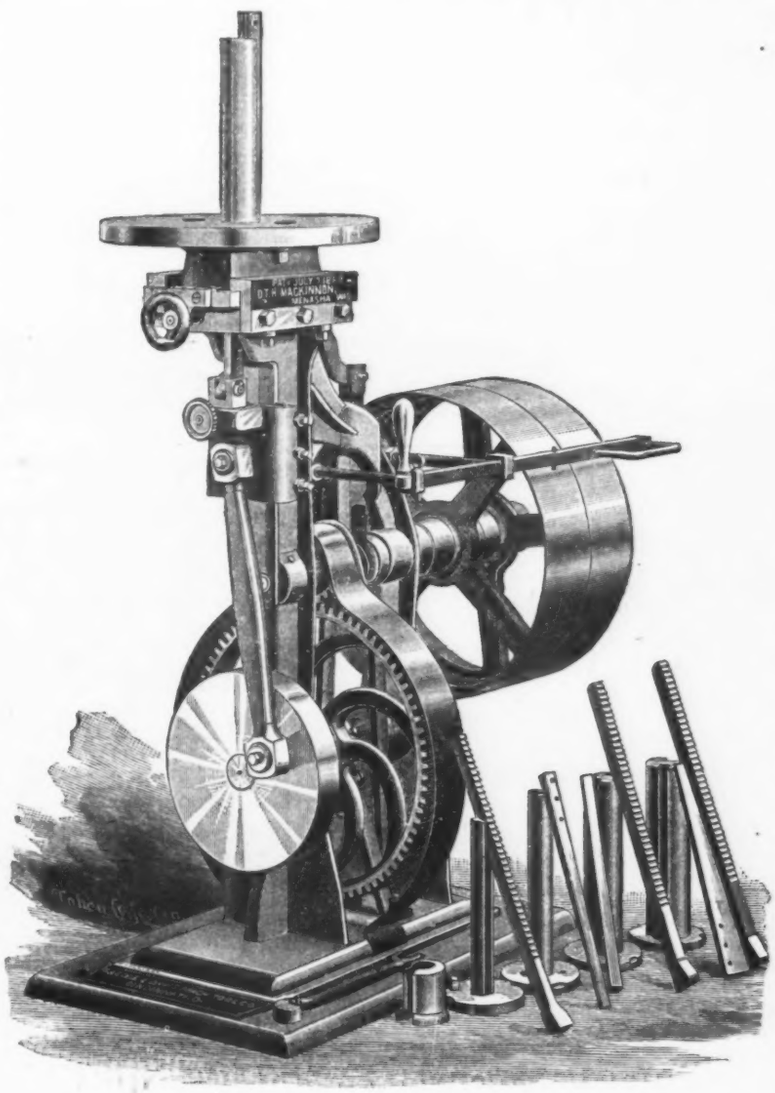
THE IRON AGE

THURSDAY, SEPTEMBER 18, 1890.

The MacKinnon Key-Way Cutter.

D. T. H. MacKinnon, of Menasha, Wis., has recently brought out a key-way cutter, which is highly commended by those who have used it. An illustration of the machine is herewith presented. It weighs 650 pounds and is made compact, durable and of sufficient strength to cut slots for keys in any size bore, $1\frac{3}{16}$ inch or over in diameter up to 9 inches in length, thus meeting the requirements of general machine work. The alignment of the slot to the bore is secured without adjustment, and as the alignment is secured by the bore it is not necessary that the work be surfaced or leveled. The fastening to hold down the work is at the central point, hence there is no unequal pressure to throw the work out of line. The same cutter can be readily adjusted for any depth or taper of slot, and has an automatic relief when out of cut or passing in a direction opposite to cut. The work of the machine does not depend on the skill of the attendant for its accuracy. Four cutters, or saws, are furnished with each machine, also five studs. These machines are for sale by the Lodge & Davis Machine Tool Co., Eggleston avenue and Sixth street, Cincinnati; 68 and 70 South Canal street, Chicago, and 64 Cortlandt street, New York.



THE MACKINNON KEY-WAY CUTTER.

The Blue Book relating to traffic on the Canadian canals last season shows it to have been the largest in the history of the system, as respects both American and Canadian trade. But the results are far from satisfactory from the Canadian point of view, taking the last few years together, from the fact that the increased traffic of the canals between United States ports far outstrips that which follows the course of the St. Lawrence River from Montreal. The principal obstacle encountered in the effort to develop the St. Lawrence trade is the lack of return cargo, the westward shipments being insignificant when compared with that of the American competitors. How to overcome the difficulty caused by the lack of return freights the Canadians confess is a problem difficult to solve. They find satisfaction in one respect—that the St. Lawrence held its own last year in the competition for grain destined to the seaboard.

The recount of Minneapolis shows a population of 164,780. This, as compared with the census of 1880, is an increase of 117,851, or 251.35 per cent. The recount in St. Paul shows a population of 133,301, an increase since 1880 of 91,473, or 223.83 per cent.

A movement in the Southern States for the establishment of direct steam communication with Europe gives promise of practical results. At Atlanta, 10th inst., a convention of delegates to consider the subject passed resolutions recommending the creation of two corporations, each with $1,000,000 capital and power to increase to $10,000,000, to promote trade at some Gulf port and another on the South Atlantic Coast. Another convention, of which each Governor of a State will be a member, will convene in January to perfect the scheme.

The Iowa Railroad Commissioners are preparing for another tussle with the railroads of the State in the courts. This is caused by a firm determination on the part of the commissioners to give the people of the State joint rates, and the equally firm determination on the part of a number of the leading railroads not to submit to further dictation at the hands of the commissioners.

Testing the Largest Crane.

The largest traveling crane yet constructed—which we described and very fully illustrated in *The Iron Age* of June 12, 1890—has been completed and was tested a few days since. It will be remembered that the crane was built by the Morgan Engineering Company, of Alliance, Ohio, after designs by John R. Morgan, the chief engineer of that company, and was for the gun shop of the Washington Navy Yard. It will be employed in handling the heavy guns, 15 and possibly 16-inch bore, to be built by the Government. While differing in many material points from the smaller traveling cranes which have been in use in the ordnance shop, it is constructed on the same general principle. It has a lifting capacity of 110 gross tons, or 246,400 pounds, and the test made a few days ago in the presence of the Secretaries of War and Navy and other Government officials was very satisfactory.

For the purpose of testing the ponderous machine to the full capacity agreed upon in the contract for its construction, 110 tons of pig iron were piled up on a platform of immense logs, securely fastened together with the largest chains in use at the ordnance shops. This tremendous weight was picked up and carried about the shop in all directions as though it were a toy, being raised or lowered or the direction changed by a simple system of levers, requiring but little skill in their manipulation.

The girders which span the shop are 62 feet in length and high enough from the floor to give a 40-foot hoist. By the system of levers referred to the speed of the hoisting machine can be adjusted to suit the load which is to be carried. It will lift its greatest weight, 110 tons gross, 1 foot per minute; 75 tons, 2 feet per minute; $37\frac{1}{2}$ tons, 4 feet per minute; $18\frac{3}{4}$ tons, 8 feet per minute; 10 tons, 15 feet per minute, and 5 tons or less, 30 feet per minute. The hoisting machinery, a mass of ponderous gear wheels and chain drums, travels back and forth on tracks on the steel girders very gracefully and with but little noise. The crane will lift easily 150 net tons.

The New York Central Railroad lost during August $557,000, and other roads not in the Vanderbilt system report less favorably.

BASIC BESSEMER STEEL—II.

Its Manufacture and its Cost.

BY J. B. NAU, E. M., NEW YORK.

(Concluded from page 366, September 4.)

The Manufacture of Basic Steel.—Since the basic process admits of a greater variation in the composition of the pig metal than does the acid, the iron can be easily taken directly as it runs from the blast furnace to be worked in the converter. This method is followed very generally in Europe whenever the furnaces are close to the steelwork. It has beside the advantage of greater economy by dispensing with a second fusion in the cupola. The economy thus realized may vary from $1.50 to $2 per ton of metal, according to price of labor, coke, &c. This practice, however, to give satisfactory results supposes a furnace working very regularly, consequently a judicious and constant attention to the charge on the part of the furnace manager.

The pig iron used can also be remelted in the cupola, but it happens frequently that the quantity of sulphur contained therein is thereby increased. This danger can, to some extent, be guarded against and even sulphur be partially eliminated by a proper treatment in the cupola. It would be well also to state that especially in the basic process sulphur can be reduced to a certain extent in the converter in presence of the basic slag. That the percentage of sulphur can be increased in the cupola when no special care is taken will be shown by the following analyses made in our works:

Operations.	Sulphur in pig metal before melting in cupola.	Sulphur of same pig after melting in cupola.
1.....	0.085	0.166
2.....	0.092	0.159
3.....	0.110	0.180
4.....	0.110	0.182
5.....	0.076	0.172
6.....	0.076	0.171

Taking into consideration the amount of coke used in the cupola and its sulphur contents, the above figures showed that about two-thirds of the sulphur of the coke had passed into the pig iron. The more silicous the pig metal the greater is the quantity of sulphur which it takes from the coke in the second melting. Chemically speaking, the reason of this must be attributed to the fact that the slag obtained with siliceous iron is more acid, consequently unfavorable to the removal of sulphur.

Whenever the pig metal is used directly, as it flows from the blast furnace, the operator has no other guide to judge of the quantity of silicon in the metal than the appearance of the grain. In this case a test is taken from the metal, to be used in the vessel. This test bar is cast in sand and cooled at once in water. Afterwards it is broken, and its fracture enables the steel maker to determine pretty closely the character of the iron. This inspection is of capital importance, since it is the only means of judging of the amount of lime to be added in the converter. The lime is charged in the converter before the pig metal and as soon as the product of a preceding heat has been run out, so as not to lose any time and to allow the lime to get somewhat heated. An excess of lime will invariably give a sluggish, limy slag, which will clog to the mouth of the converter. An experienced operator will soon judge of the real amount of lime required. The question of the addition of the proper amount of lime to be added is the turning point of the fabrication of basic steel. Not enough of it will leave silica and phosphoric acid, partially combined with oxide of iron, furnishing a product easily decomposed. A partial return of the phosphorus to the steel is sure to follow.

When the lime has been charged, the heat is conducted just as in the acid Bessemer process. Silicon and carbon are eliminated first. Towards the end a spectroscope should be used, to determine exactly the point at which decarburation, finishes and dephosphorization or overblowing must begin. With pig metal nearly constant in composition, the time of blowing does not vary much. Experience will teach how to judge by the color of the smoke when the end of the operation is near. The vessel is then lowered, a sample of the metal is taken and flattened under a tilt hammer to the shape of a disk about ⅛ inch thick. This disk is doubled up and examined at the bend, where in most cases the sample shows signs of breaking or breaks completely. When phosphorus is still present in too great quantities the appearance of the fracture is characteristic, and a second blowing is resorted to if found necessary. Its duration, with or without addition of lime as the case may be, depends entirely on the examination of this fracture, and can be judged only by the practiced eye of the operator. Practice in this direction is readily acquired, and once obtained there is no mistake possible. When the operation is completed the supernatant slag must be run off at once and with great care to avoid all possible subsequent rephosphorization of the metal, which is unavoidable after recarbonizing if any part of the slag remains in contact with the iron. Even with the small amount of slag that it will be impossible to remove completely without losing some of the metal, this rephosphorization takes place in the upper strata, which are in immediate contact with the slag.

The following analyses, which I have had made purposely to elucidate this question, speak for themselves:

Phosporus in Metal.

Operation	Before addition of spiegel.	After recarburation.
1.....	0.047 per cent.	0.062 per cent.
2.....	0.033 "	0.057 "
3.....	0.061 "	0.085 "
4.....	0.024 "	0.041 "
5.....	0.059 "	0.094 "
6.....	0.037 "	0.077 "
7.....	0.039 "	0.068 "
8.....	0.060 "	0.093 "
9.....	0.042 "	0.064 "

These analyses also show how far the dephosphorization can be carried on, the original pig used containing on an average 1.8 per cent. of phosphorus. The increase of phosphorus in the steel after the addition of the recarburating agent is dependent upon the contents of oxide of iron, combined with phosphorus, in the slag which is above the metal. This is generally the case when the amount of lime used has been insufficient. The dephosphorization of the metal sometimes may be due to another cause than lack of lime. Manganese also must be considered as having a great influence. It is obvious that even with an insufficient amount of lime, dephosphorization can be avoided if the pig metal contains a quantity of manganese sufficient to take the place of iron in its combination with phosphorus or phosphoric acid.

I have made a few observations on this point which may be of some interest. In certain steel works of the same district as ours, and in which pig metal containing only 0.3 per cent. of manganese was treated

Table I.—Manufacture of Basic Steel at the Creuzot (France).

A.—ANALYSES OF PIG IRONS TREATED.*

Basic steel. Rail steel.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
Silicon	1.17	1.09	1.06	0.50	2.05	1.04	2.29	1.75	0.48	0.70	1.87	1.89	1.35	1.40	1.66
Sulphur	0.068	0.085	0.06	0.15	0.11	0.126	0.048	0.064	0.28	0.17	0.13	0.17	0.16	0.098	0.076
Manganese	2.42	2.42	2.52	0.98	2.08	2.08	2.90	2.98	0.71	1.58	2.74	2.00	2.36	2.86	2.96
Phosphorus	Varying from 2.20 to 2.38 per cent.														

B.—ANALYSES OF CORRESPONDING STEELS OBTAINED.

Carbon	0.51	0.42	0.43	0.46	0.50	0.60	0.50	0.44	0.41	0.49	0.50	0.51	0.51	0.48	0.49
Sulphur	0.023	0.020	0.028	0.070	0.030	0.030	0.019	0.019	0.078	0.050	0.013	0.027	0.023	0.032	0.030
Phosphorus	0.065	0.037	0.049	0.049	0.052	0.026	0.036	0.049	0.033	0.052	0.068	0.036	0.049	0.041	0.057
Manganese	0.84	0.71	0.58	0.96	0.80	1.14	0.80	0.78	0.73	0.88	1.10	0.75	0.97	0.82	0.81
Silicon	Not always determined, trace to 0.02 found when looked for.														

C.—STRENGTH OF STEELS MANUFACTURED.—POUNDS PER SQUARE INCH.

Tensile strength	98317	86002	81931	95013	95702	118284	96665	111261	88002	91570	108645	94876	111261	98043	99144
Elongation per cent.	17.5	21	21	15¼	17	9½	17½	6	21½	19	15	18	13	18	18

A.—ANALYSES OF PIG IRON TREATED.*

	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	Av'rage.
Silicon	1.80	1.70	1.80	1.30	1.02	1.43	1.24	1.80	2.48	1.74	1.35	1.41	2.13	0.70	1.44
Sulphur	0.17	0.135	0.17	0.22	0.305	0.15	0.19	0.115	0.085	0.13	0.135	0.23	0.082	0.155	0.139
Manganese	2.36	2.18	2.36	1.68	1.28	1.22	2.38	2.42	2.90	1.96	1.86	1.56	2.84	1.88	2.16
Phosphorus	Varying from 2.20 to 2.38 per cent.														2.30

B.—ANALYSES OF CORRESPONDIG STEELS OBTAINED.

Carbon	0.52	0.52	0.52	0.51	0.54	0.50	0.43	0.50	0.49	0.49	0.44	0.53	0.51	0.51	0.491
Sulphur	0.022	0.018	0.022	0.050	0.030	0.038	0.080	0.024	0.022	0.020	0.038	0.033	0.028	0.037	0.031
Phosphorus	0.033	0.049	0.033	0.025	0.049	0.049	0.065	0.057	0.049	0.049	0.041	0.041	0.052	0.048	0.045
Manganese	0.88	0.79	0.88	0.73	1.12	0.82	0.76	0.82	0.81	0.87	0.50	0.72	0.56	0.80	0.82
Silicon	Not always determined, traces to 0.02 found when looked for.														

C.—STRENGTH OF STEELS MANUFACTURED.—POUNDS PER SQUARE INCH.

Tensile strength	101485	93917	101485	92259	112363	99832	92396	97491	95839	101759	84633	97767	87407	103875	97767
Elongation per cent.	13	18	13	20¼	11¼	18	22	18	22	18	20	18	23	22	17.60

* The pig metal was taken directly at the blast furnace and run into the converter.

and a quality of extra soft steel was manufactured, it had been observed that out of the same cast of extra soft steel there were found some billets ofextra hard steel, so hard, indeed, that it could be worked into cold chisels. Such steel was invariably obtained from the upper strata of the molten mass in the ladle—that one directly in contact with the slag. The explanation of this occurrence can be easily given. The production of extra soft steel those made, when the basic process was first put to a practical test in the different steel works of Europe, have shown that phosphorus, sulphur and carbon are not equally distributed through the mass of the bath. On account of their lesser density, or of that of the combination they are engaged in, these substances are found in greater quantities in the upper strata, as well as in those which remain fluid the longest. In the case quoted above, the nese, rich in manganese is used. The ferromanganese is sometimes put into the vessel, sometimes into the ladle. It is preferable to put the ferromanganese into the vessel to avoid unnecessary boiling of the metal in the ladle—boiling that is often continued in the molds when the steel is poured into them from the ladle, and may be the cause of bad ingots.

Having thus given a general description of the manufacture of basic steel, bringing

Table II.—Manufacture of Basic Steel at Hayange (M. DeWendel, Lorraine) and Jœuf (France).

ANALYSES OF PIG IRON TREATED.*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Av.	1	2	3	4	5	Av.
Silicon	1.089	1.083	0.824	0.513	0.523	0.523	0.500	0.458	0.295	0.435	0.855	1.438	1.438	0.505	1.18	1.00	0.790	0.567	0.597	1.68	1.49	1.477	1.16
Sulphur	....	....	....	0.183	0.203	0.203	0.353	....	0.244	0.221	0.148	0.060	....	0.119	0.075	0.100	0.173	0.133	....	....	....	....	....	0.13
Phosphorus	2.751	2 695	2.690	2.400	2.590	2.590	2.537	2 754	1.767	1.730	1.700	1.720	1.720	1.750	1.760	1.720	2.18	1.727	2.24	1.714	1.780	1.776	1.853
Manganese	1.947	1.803	1.406	1.460	1.260	1.260	0.741	0.901	0.997	1.11	1 5 8	1.62	1.62	1.59	1.52	1.98	1.42	0.781	1.230	1.843	0.721	2.777	1.27

ANALYSES OF CORRESPONDING STEELS.

	Steel rails.																	*Ordinary soft steels.*					
Carbon	0.42	0.47	0.47	0.43	0.42	0.48	0.67	0.37	0.35	0.42	0.41	0.44	0.51	0.43	0.38	0 44	0.438	0.11	0.13	0.16	0.17	0.16	0.14
Silicon	0.023	0.025	Tr's	...	...	.....	Trcs	Trcs	0.021	.....	....	....	....	.....	.....	....	.....	...	.....	.....	.....	.....	.....
Sulphur	0.031	...	0.037	0.034	0.030	0.039	0.167	....	0.032	0.054	0.024	.....	.....	.....	.....	.....	0.035*	0.097	.....	.....	.....	.....	.....
Phosphorus	0 058	0.043	0.064	0.066	0.062	0.064	0.072	0.068	0 055	0.051	0.042	0.55	0.04.	0.044	0.043	0.047	0.054	0.048	0.079	0.057	0.086	0.067	0.067
Manganese	1.15	....	0.793	1.118	0.973	0.720	.....	....	0.540	0 480	0.504	.....	.....	.....	.....	....	0 792	0.483	0.721	0.830	0.952	0.910	0.780

STRENGTH OF STEEL MANUFACTURED—POUNDS PER SQUARE INCH.

Tensile strength	10 173	100244	85596	86745	.....	.....	.....	.....	85321	100382	90744	91157	97079	94462	93912	95159	93548	68850	65132	63342	65820	66005	65850
Elongation, per cent.	13	15	11.5	12	.....	.....	.....	..	21.25	12.60	19.00	10.00	14.00	15.00	19.00	14.50	14 74	28	28	29	29	28	28.4

N. B.—At Hayange the tenure in phosphorus for all steels was not to reach over 0.080 per cent. Whenever the blower would keep the steel below 0.080 per cent. he was to receive 2 cents per ton as extra, and whenever the tenure reached over 0.08 he was to pay 6 cents per ton. With these restrictions it was found necessary to fix a maximum of *extras*, not reaching over $30 per month, which were sure to be drawn monthly as regularly as a salary.

* Excepting 0.167 as normal. The pig iron was taken directly at the blast furnace.

TABLE III.—Manufacture of Basic Steel at the Steel Works of Longwy, at Mt. St. Martin, France.

ANALYSIS OF PIG IRON TREATED.

Silicon ..... .612
Manganese ..... 1.2 to 2.00 } Average composition.
Phosphorus 1.803

STEELS FOR BED SPRINGS MADE WITH PRECEDING PIG IRON WITH VARIABLE AMOUNTS OF PHOSPHORUS, MANGANESE AND CARBON, FOR THE PURPOSE OF EXPERIMENTING ON THE ELASTICITY OF THE PRODUCT. | EXTRA SOFT STEELS.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Av.	1	2	3	4	Av.
Carbon	0.24	0.15	0.16	0.18	0.25	0.12	0.26	0.23	0.23	0.18	0.25	0.18	0.13	0.24	0.20	0.17	0.18	0.21	0.197	0.09	0.09	0.10	0.09	0.09
Phosphorus	0.033	0.027	0.035	0.026	0.025	0.032	0 058	0.0 2	0.078	0.075	0.078	0.045	0.028	0.096	0.027	0.028	0.051	0.075	0.046	0.028	0.0 6	0.028	0.030	0.028
Manganese	0.350	0.450	0.400	0.45	0.450	0.250	1 00	0 550	0.350	0.350	0.350	0 450	0.350	0.350	0.250	0.400	0.450	0.750	0.440	0.450	0.350	0.550	0.450	0.450

RESISTANCE OF STEEL MANUFACTURED.

Tensile strength, lbs.	65682	60863	67197	66509	66776	59624	81650	63204	69713	64168	73944	65477	....	69496	65682	70089	66639	66820	67263	56870	52295	56870	59624	56415
Elongation, per cent.	26.4	27.8	29.0	25.4	23.7	13.8	19.3	21 0	22.0	23.5	17.7	26.5	....	22.7	24.5	24.0	21.5	23.1	23.0	25 5	30 0	29.0	27.0	27.9

N B.—The average analysis of all the extra soft steels at these works for that period was:

Silicon	traces	Manganese	0.45
Carbon	0.09	Sulphur	0.035
Phosphorus	0.04		

And the maximum of these elements as allowed by the customers was:

Silicon	traces	Manganese	0.55
Carbon	0.11	Sulphur	0.08 to 0.09
Phosphorus	0.05		

Table V.—Analyses of Rail Steel Manufactured in the United States. (Under Supervision.)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Av.
Carbon	0.32	0.40	0.21	0 22	0.21	0.27	0.25	0.31	0.36	0.31	0.33	0.30	0.36	0.32	0.32	0.26	0.90	0.34	0.38	0.30	0.28	0.32	0.31	0.30
Manganese	0.84	1 00	0.59	0.59	0.97	1.03	1.09	0 98	0 69	0.75	0.75	1.05	1.25	1.20	1.20	0.90	1.15	1.50	1.80	0.85	0.95	1.20	1.25	1.03
Silicon	0.15	0.06	0.04	0.09	0.10	0.12	0.09	0.06	0.07	0.028	0.065	0.075	0.056	0.117	0.079	0.033	0.065	0.104	0.117	0.057	0 069	0.104	0.076	0.078
Phosphorus	0.10	0.09	0.113	0.094	0.067	0.047	0.045	0.051	0.089	0.092	0.099	0.092	0.095	0.110	0.095	0.092	0.117	0.110	0.095	0.089	0.085	0.084	0.087	0.089
Sulphur	0.020	0.06	0.048	.....	.....	....	.. ..	.....	0.045	.....	. ..	0.033	0.027	0.027	0.091	0.099	0.049	0.058	0.074	0.054	0.051	0.052	0.056	0.053

Sir Lowthian Bell, page 414 (Principles of the Manufacture of Iron and Steel, 1884), gives as the average analyses of 20 steel rails made in England for the North Eastern Railway:

	Bessemer Rails.	Basic Process Rails.		Bessemer Rails.	Basic Process Rails.
Carbon	0.452	0.450	Phosphorus	0.052	0.054
Silicon	0.105	0.065	Manganese	1.178	1.201
Sulphur	0.121	0.095	Iron	98.092	98.145

makes it necessary to carry the operation of refining to the extreme, and, consequently, to burn a certain quantity of iron. If the addition of lime in the converter has been a little short, the oxide of iron, in the absence of manganese, combines with phosphorus, forming a compound readily decomposed by the carbon of the recarburating agent. Liberated phosphorus re-enters the bath. The experiments of Mr. Snelus, and in fact all phosphorus and phosphoric acid remaining in the bath after the decomposition of the phosphate of iron of the slag did not reach very low, but remained in the upper strata of the molten metal, furnishing these samples of an extra hard steel; hardness being given in this special case by phosphorus.

The carbonating agents used are either spiegel or ferromanganese, according to the quality and hardness of steel required. For extra soft steel, generally ferromanganout the principal characteristic difference of composition of the materials required in the acid and basic process, I will complete the above by some considerations on the composition, quality and conditions of production of the two steels.

Composition and Quality.—The analyses presented in Tables I, II, III, IV and V show the composition of basic steel manufactured in Europe for different purposes, including hard, soft or extra soft steel, and

that of Bessemer steel from England and the United States.

BASIC STEEL.

Table IV.—Manufacture of Basic Steel at Hollrich (Luxemburg). Pig Iron Desilicized in One Vessel and Dephosphorized in Another.

PIG IRON TREATED.

Experiments made with all grades of pig iron from No. 1 foundry gray to cold white cavernous pig:

	1	2	3	4	5	Aver.
Carbon	3.905	3.504	3.467	2.945	Cold white cavernous.	.....
Silicon	2.198	1.563	0.915	0.244		.....
Sulphur	0.054	0.083	0.099	0.314		.....
Phosphorus	1.882	1.514	1.994	1.518		.....
Manganese	0.161	0.366	0.354	0.248		.....

ANALYSES OF STEEL OBTAINED.

Carbon	0.149	0.158	0.218	0.154	0.139	0.163
Silicon	0.100	0.065	0.059	0.065	0.103	0.078
Sulphur	0.055	0.058	0.063	0.112	0.336	0.097
Phosphorus	0.021	0.007	0.014	0.084	0.042	0.036
Manganese	0.153	0.264	0.248	0.102	...	0.192

No. 6 not counted in the averages as being an exceptional amount of sulphur in pig not to be used to make steel.

Table VI.—Resumé.

STEEL RAILS.

	Basic process.				Bessemer process.		
	Creuzot.	Hayanges and Eastern France.	England	Average.	England.	United States.	Average.
Carbon	0.491	0.438	0.450	0.459	0.452	0.300	0.375
Silicon.	traces to 0.025		0.065	0.039	0.105	0.078	0.091
Sulph'r	0.031	0.035	0.095	0.053	0.121	0.053	0.087
Phosphorus	0.045	0.054	0.054	0.051	0.092	0.089	0.070
Manganese	0.820	0.792	1.201	0.930	1.178	1.03	1.09

Taking only into consideration the sulphur, phosphorus and silicon elements, of which the amount in the pig metal used to manufacture the steel constitute the characteristic difference in the two processes, and of which the more or less complete elimination bears directly on the quality of a given grade of steel, hard or soft, we find:

	Basic steel.	Bessemer.
Silicon	0.039	0.091
Sulphur	0.053	0.087
Phosphorus	0.051	0.070 or higher, according to pig iron.
	0.143	0.248

It may be stated, therefore, that other things being equal, these three elements are found in considerably less quantities in the basic than in the Bessemer steel. The least which can be claimed, at any rate, as resulting from an inspection of the above table, is that on the score of composition, as well as of resistance and quality, the basic steel can in every respect compare very favorably with the acid steel.

These tables show what variety of composition in pig iron is admissible, though not always to be recommended for the manufacture of basic steel. The silicon contents varies from hardly 0.3 per cent. to 2.48 per cent.; that of manganese from 0.89 to 2.98, being as low in one case (table IV) as 0.161 per cent.; that of phosphorus from 1.50 per cent. to 2.75 per cent. I have even used pig metal containing over 3 per cent. of phosphorus with equally good results; unfortunately, I have not in my possession a record of the analyses of the steel obtained. All the above steels (Creuzot and English steel excepted) have been manufactured either under my own supervision or according to my instructions as to the composition of the metal to be obtained. Some of the operations date as far back as 1881, the time of the first introduction of the basic process in the works with which I was connected in Europe, and were made more specially with the view to experiment on the best composition of the pig metal, or on certain qualities of steel to be obtained. In fact, all pig metal from No. 1 gray to for forged mottled iron, which latter price may be even considered high for basic pig. It would indeed be easy to show that basic pig iron could be manufactured at a cheaper price than $14.50 from many ores to be found in New Jersey and many other States—ores that at present are considered valueless, as unadaptable to most purposes outside of basic iron.

Table VII.—A Comparison of Cost.

COST OF RAIL STEEL.

Acid Process.		*Basic Process.*	
1.04 tons of Bessemer pig at $19 per ton, 8 per cent. spiegel	$19.76	1.07 tons of basic pig at $14.50. 8 per cent. spiegel.	$15.51
1.12 Acid lining of converter per ton	.30	1.15 Basic lining, 100 pounds per ton of steel at $10 a ton	.50
		Lime added, 20 per cent. of steel or 4.50 pounds per ton at $10 a ton	2.00
Total	$20.06	Total	$18.01
		Difference in favor of basic process	2.05
			$20.06

COST OF SOFT STEEL.

Acid Process.		*Basic Process.*	
1.10 tons of Bessemer pig at $19 per ton, 2 per cent. of ferro.	$20.90	1.13 tons of basic pig at $14 50. 2 per cent. of ferro.	$16.38
1.12 Acid lining of vessel per ton	.30	1.15 Basic lining, 100 pounds per ton of steel at $10 a ton	.50
		Lime added, 20 per cent.	2.00
Total	$21.20	Total	$18.88
		Difference in the cost in favor of basic steel	2.32
			$21.20

cold cavernous white pigs, has been treated. The analyses of steel show how completely the phosphorus can be removed. We find in Table IV steels containing only 0.007 to 0.014 per cent. of phosphorus made with pig containing from 1.50 to 2 per cent. of phosphorus. As may be noticed, sulphur is also considerably diminished, owing to the presence of a basic slag. As far as silicon is concerned, it is reduced to "traces" or to less than 0.03 per cent.; to so low a figure, in fact, that its determination has been generally omitted.

Cost.—The acid Bessemer process requires pig metal containing a large amount of silicon, involving, as a consequence, a blast furnace working hot, hence an iron rich in carbon—conditions tending to an increase of cost in the smelting of the ores. A very low limit is demanded for phosphorus in the pig metal, since none or practically none is removed either in the blast furnace or the converter, it implies, therefore, the smelting of special ores more expensive than others and not to be found in every locality.

In the basic process pig metal containing a moderate amount of silicon, from 0.6 to 1 per cent., as we have seen, and a large amount of phosphorus is required. That is, a pig metal of the lowest grade of gray and even mottled and white, which can be produced more cheaply in the blast furnace and from ores rich in phosphorus, not even adapted to making strong foundry irons. The question of comparison of cost price of the two steels must therefore deal with the relative economy in the price of the pig metal used in both cases as compared to the greater outlay for the lining of the converter and especially the lime added in the basic process.

Admitting, in both cases, that the pig iron is bought at market price to be treated in the converter, and not taking into consideration those expenses which, being common to both processes, have no bearing whatever on the relative economy of one over the other, the difference of the relative cost price must be based on: 1. The pig iron used; 2. The materials of the lining; 3 The losses involved in each process; 4. The addition of lime in the basic process.

As quoted at Pittsburgh, June 19, 1890, we find that the prices were $19 per ton, at furnace, for Bessemer pig, and $14.50

In the preceding tables I have put down the loss on pig iron per ton of steel to be 12 per cent. in the acid process and 15 per cent. in the basic, which gives 1.12 and 1.15 tons of pig respectively used per ton of steel. This loss of 15 per cent. in the basic process may be considered the maximum. Our own experience has also shown us that 100 pounds of basic material per ton of steel for the lining is rather a high figure. The price of calcined dolomite and limestone has been taken at $10 per ton, which is certainly rather an unfavorable one, as the following table will show:

Cost of Calcined Dolomite Per Ton.

Raw dolomite at furnace	$2.25
Loss, 50 per cent. by fire on raw material	1.12
Labor, three men for 12 hours, at $2 = $6 for a production of 4 tons of dolomite	1.50
Coke, 20 per cent. of raw material = 40 per cent. of calcined dolomite, at $4.50	1.80
	$6.67
10 per cent. repairs	.66
	$7.33
10 per cent. tar per ton of calcined dolomite, at $20 a ton	2.00
Total cost price per ton of calcined dolomite	$9.33

This table has been made up from figures obtained by personal experience. The price of raw dolomite has been taken at $2.25 a ton, which certainly will be considered high by every furnaceman who knows that limestone, not more expensive than dolomite, can be obtained at a much lower price, $1 paid per ton of limestone used in blast furnaces being a high price in certain localities. We have paid in the United States as low as 78 cents per ton laid down at the furnace. In the works, less is paid for it. Hence the assumption of a difference of $4.50 per ton in the price of the pig metal, required in each case, would give a difference of over $2 per ton of steel obtained in both cases.

Perhaps it would be interesting to say that the difference in the cost of the two pig metals reaches as much as 10 shillings to 15 shillings ($2.50 to $3.75) in certain parts of England, and in Westphalia and Eastern France almost to double that amount ($5 to $7.50). Lowthian Bell, p. 407, Iron and Steel.

Therefore, in assuming a difference of $4.50, as above, we feel sure of being below the real figure.

In establishing the above comparative cost prices per ton of steel I have not

taken into consideration an important factor, the reduced output of the basic process. As this might give rise to legitimate objections, I shall enter into some details on this point. Let it be supposed that, owing to the time devoted to the taking of samples and running of cinders, the daily output in a basic plant would be reduced 25 per cent. as compared with the output of a similar plant working with acid process. Thereby such expenses as labor, repairs and tools, incidentals, coal burns for boilers and general expenses, would be increased by 25 per cent. Based on a limited production of 300 tons daily, these items in a certain establishment in the United States amounted to about $4 per ton, and without labor would amount to $2.25. These figures would be materially reduced in proportion as the plant were larger. An increase of 25 per cent. for the basic plant would consequently raise the cost price per ton of basic steel by $1. This would leave a difference of $1 in favor of the basic process. It should be observed, however, that I have purposely taken the most unfavorable figures for prices of dolomite, lime and pig iron in the calculation of the above table for basic steel, and that certainly the coal consumed for boilers as well as the items of repairs and tools are not materially increased in the proportion of 25 per cent. per ton, especially, as already remarked, when the proportion is greater. It might be also said that Sir Lowthian Bell("Manufacture of Iron and Steel," p. 705) states that the "pretended extra waste and additional labor for basic steel is 10 shillings per ton or $2.50. I have taken above $4.50 as the difference of cost per ton of pig metal used in both cases. According to Sir Lowthian Bell's figures of $2.50 per ton, the difference in favor of the basic process would still remain $2 per ton. Besides, in Eastern France, as well as in Western Germany and Belgium, phosphorus ores, containing only from 33 per cent. to 40 per cent. of iron, are smelted to-day very extensively and economically. In Belgium and Western Germany the ores used for that purpose are Luxemberg ores shipped sometimes at a great distance, and still, in spite of the fact that the price of pig iron is increased by a high freight, the basic steel works work economically and are enabled to compete advantageously with Bessemer steel works.

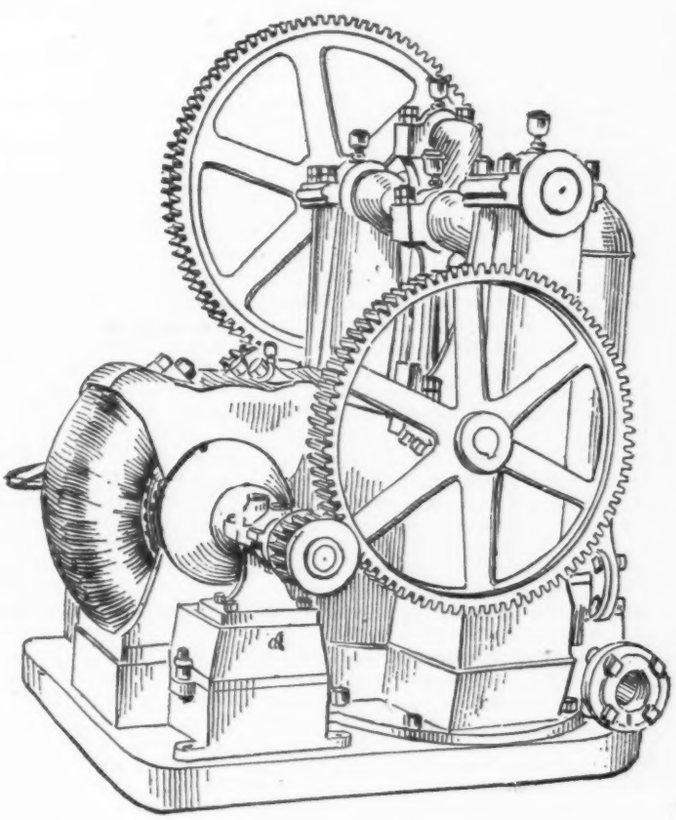
Conclusion.—The composition, quality and estimated cost of production of the two steels, acid and basic, have furnished results entirely in favor of the basic steel, and this process is particularly adapted to give a product of an extra softness unknown in the Bessemer acid, and of a composition much more regular and more certainly obtained from a given pig.

In every case in the basic process the pig metal can be run directly from the furnace, a practice not always admissible in the acid Bessemer. A second fusion in the cupola supposes an extra cost, which has not been taken into consideration in the above estimate.

Combinations of manufacturers and corporations to resist the alleged extortions and tyranny of labor organizations are becoming more frequent. A Pittsburgh telegram says: "A number of the richest corporations in the country have formed an alliance against strikes. Among the corporations which are members of the combination are the Westinghouse system, both in that city and elsewhere, the Yale Lock Company, the Colt Arms Company and four or five other big factories in Connecticut, and presumably the Pullman interests. The compact agreed to is that in case a strike occurs to enforce unreasonable demands—whether the strike be against one or all of the associated factories—all work is to cease. The strikers are to be allowed to remain idle until they see fit to return to work, and no factory is to employ any worker who may have left another factory on a strike; neither is any associated factory to seek workers during a strike from any other federated works. The institutions named employ between 50,000 and 60,000 workers, and directly support some 250,000 to 300,000 people, exclusive of other interests depending upon the earnings of these people. It is claimed by these manufacturers that the action of their workers has forced the alliance."

Triplex Electric Pump.

The three cylinder suction and force pump made by the Goulds Mfg. Company, of Seneca Falls, N. Y., is well known. This pump is now brought forward so arranged as to be driven by an electric motor. The pump proper consists of three cylinders, the plungers of which are actuated by a three-throw crank; there is consequently no dead center or point of varying load, and the pump offers absolutely even and unvarying resistance to the motor under all conditions. The pump can be adapted for any make of motor. The drawing shows the manner of transmitting the power from the motor to the pumps. On the armature shaft is a pinion meshing with a large gear on an intermediate shaft carrying at its opposite end a second pinion engaging with a gear on the crank shaft.



TRIPLEX ELECTRIC PUMP.

Tests made by the Thomson-Houston Motor Company of one of these pumps driven by one of their electric motors showed the efficiency at different pressures to be as follows:

	Per cent. efficiency.
0 pounds per square inch.....	7 to 10
20 pounds per square inch.....	47 to 50
50 pounds per square inch.....	60.2 to 61.5
75 pounds per square inch.....	64.3 to 67.4
100 pounds per square inch.....	67 to 68.2
150 pounds per square inch.....	65.4 to 67.2

In the above tests the water was lifted 52½ inches in addition to the pressure of discharge given. The test on friction without moving the water at all was:

20 strokes per minute.....0.96 horse-power.
30 strokes per minute.....1.57 horse-power.
40 strokes per minute.....2.20 horse power.
49 strokes per minute.....2.98 horse-power.

Throughout the tests the pump ran very smoothly; there was no heating and the gearing (the pinions are of raw hide) was practically noiseless.

The War Department has approved of the plans adopted by the Board of Ordnance and Fortifications for the defense of New York harbor, this being a part of the general scheme for coast defense advocated by several successive administrations. The details contemplate the occupation of parts of Sandy Hook, Coney Island, Staten Island Hollows, Fort Schuyler and Willett's Point. The total appropriation for this scheme this year is $726,000. This completed project includes the establishment of torpedo systems, rapid firing gun batteries, submarine mines and heavy armor protected batteries, with 12-inch breech loading rifles, altogether involving an expenditure of $14,500,000.

The Scottdale (Pa.) Iron and Steel Company, after two years' unprofitable experimenting with gas, will return to the use of coal. The company sustained considerable loss through being unable to operate the mill at various periods during the winter on account of the deficiency in the gas supply.

A small pamphlet has been issued, descriptive of the J. K. Griffith stopper and nozzle for open hearth and Bessemer steel ladles manufactured by R. B. Seidel, of Philadelphia. It has been used by the Latrobe, Midvale and the Bethlehem Companies.

The Westinghouse Chicago Scheme.

A sensational dispatch was sent out from Pittsburgh on the 11th inst., stating that the great interests of Pullman's Palace Car Company on the one hand and the Westinghouse Electric Mfg. Company on the other were to be consolidated. This would have been very important if true. The Pullman interests are so vast and the Westinghouse plant at Pittsburgh is so large that the reported consolidation would have made one of the very largest manufacturing corporations in the world.

It now transpires that arrangements have been made between George Westinghouse, Jr., of Pittsburgh, and George M. Pullman, of Chicago, by which the Westinghouse Electric Mfg. Company will erect works conveniently close to the Pullman Palace Car Works, at Pullman, Ill., and the agreement reached, it is understood, is that the Pullman company will purchase all of their electric railway motors from the Westinghouse concern. The works to be erected are to cost between $400,000 and $500,000, and Mr. Westinghouge says 2000 men will be employed at the new shops. Work on the structures will probably begin next spring. That the immense works of Pullman's Palace Car Company and the big plant of the Westinghouse Company, at Pittsburgh, are to be consolidated both Messrs. Pullman and Westinghouse deny. Mr. Westinghouse further says that the erection of works at Pullman does not mean that the Pittsburgh business of the company is to be removed to Chicago. It will be merely an extension of their business. The works at Newark, N. J., will also be continued as before. The Westinghouse motor is comparatively a new invention. Several roads, however, have been equipped with it and are now in successful operation. Among other places the street car companies at Pullman and at Lansing, Mich., use the Westinghouse motor. The cars run noiselessly and the cost of operating the road is said to be remarkably low. Negotiations are now pending with one or two of the proposed Pittsburgh roads, and it is quite probable that they will be equipped with Westinghouse motors and Pullman cars. Mr. Westinghouse already has orders, it is said, for the equipment of 36 roads at a cost of $750,000.

Packing Goods for Export.

A correspondent of one of the Chicago dailies writes a practical letter on the subject of American exports to South American countries, in which he urges our manufacturers to study the conditions governing South American trade and conform to them strictly. We extract from it the following important paragraph: "Another illustration which was brought to my attention was that of a shipment of mining machinery sent from New York to Para, and intended to use at a distant point up the Amazon River several hundreds of miles distant from a railroad. Transportation had to be effected by detaching the machinery into as small pieces as possible and packing them on the backs of mules. The machinery was packed in New York as if it merely had to be transported to some near point in New York State easy of access. The wooden framework placed around it was slight and easily broken. Important small pieces of the machinery, such as screws, nuts, &c., without which it could not be put together, were simply strung on a piece of string and tied to one of the large pieces. When the machinery was unloaded from the ship into the lighter at Para the string broke and the nuts, screws and other necessary pieces fell into the bottom of the lighter. On being unloaded at the wharf the careless stevedores did not trouble themselves to pick up the missing articles and the machinery was shipped inland without them. On arriving at its destination the machinery was found to be useless, and a trip of hundreds of miles had to be made to a machine shop where the missing parts could be duplicated. The consignee naturally was much disgusted with the way in which North American merchants did business and transferred his custom to an English house."

The New Uniform Freight Classification.

C. E. Gill, chairman of the Official Classification Committee, has issued an important statement showing comparisons in rates on about 500 articles between official classification as now in effect by Eastern roads and the proposed new uniform classification, on basis New York and Chicago. He directs special attention to the summary appended to his statement, embodying the change in rates in the more important articles of traffic.

Rate basis of present official classification is as follows: First class, 75 cents; second, 65; third, 50; fourth, 35; fifth, 30, and sixth, 25.

Rate basis of proposed uniform classification is as follows: First class, 75 cents; second, 65; third, 55; fourth, 45; fifth, 35; sixth, 32½; seventh, 30; eighth, 27½; ninth, 25; tenth, 22½, and eleventh, 20.

Special attention is called to the changes in rates on the following articles of traffic:

Official Classification.		*Uniform Classification.*	
	L.C.L. C.L. Cents per 100 pounds.		L.C.L. C.L. Cents per 100 pounds.
Agricultural implements	30	Same	32½
Cartridges and shells	65 35	Same	75 ..
Coffee	25	Same	30
Dry goods—cotton	50 ..	Same	65 ..
Farina, in barrels or boxes	36 25	Farina, in boxes	55 ..
Fertilizers	25	Farina, in brls.	35 30
Flour	30 ..	Same	22½
Furniture, 16,000 pounds	50	Same	35 ..
Grain	30 ..	Same, 15,000 pounds	55
Grits, in bags or barrels	30 25	Same	35 ..
Guano	35	Grits, in boxes	35 30
Hardware	50 ..	In bags or brls.	35 25
Liquors, &c.	65 35	Same	22½
		Same	55 ..
		Same	75 55
		Liquors, valuation not to exceed $20 per barrel	65 35
Locomotives and tenders, loaded on cars	35	Same	32½
Locomotives, on own wheels	30	Same	32½
Hogs, dressed, whole	75 50	Same	65 55
Meats, dried, smoked or salted	35	Same	32½
Oatmeal	30 25	Oatmeal, in boxes	35 30
		Oatmeal, in barrels	35 25
Ore, iron	25	Same	22½
Paints, various	50 ..	Same	45
Paper, wrapping	65 ..	Same	55
Paper stock, pressed in bales	30 ..	Same	35 22½
Pulp, wood, dry	50 30	Pulp, wood	35 22½
Pulp, wood, wet	35 25		
Rags, pressed in bales	30 ..	Same	55 22½
Salt	25	Same	22½
Sugar, grape	25	Same	30
Sugar, N. O. S.	25	Same	30
Tinware	35 ..	Same	55
Tobacco, plug	30 ..	Same	65
Wheat, cracked	30 25	Wheat, cracked, in boxes	35 30
		Wheat, cracked, in barrels	35 25
Wool, in sacks or bales	65	Same	65
		Wool, machine compressed	45

Commenting upon this showing, the Chicago *Tribune*, evidently voicing the sentiments of large Western shippers, says:

"It will be noticed that on nearly all the important articles of freight the rates under the new uniform classification are advanced from 10 to 25 per cent., while only on a few unimportant articles the rates are reduced slightly. As they did in the matter of a uniform bill of lading, the railroads have taken advantage of the general demand for uniformity in classification and arranged it so as to benefit themselves only and put the shippers in a hole. When Congress authorized the Interstate Commission to fix a uniform classification it was not contemplated that such uniformity should be secured at the expense of the public. It was the intention to have a uniform classification that would not advance the rates, but if anything make them lower. Had the Interstate Commission believed the railroads would arrange such a classification as shown above it never would have allowed the railroads to squander two years in bringing about such an absurdity. There is no possible chance that the commission ever will approve of this classification, and the result will be that the commission will take the matter in hand and arrange a uniform classification satisfactory to the shippers as well as to the railroads. The shippers will no more submit to such an extortion as is contemplated by the new classification than they did to the attempt of the railroads to place all responsibility upon the shippers in fixing up a new bill of lading."

A full review of the trade and business of New Orleans during the last 12 months shows that the port has lost none of its commercial and maritime importance. In nearly every line of business there is growth, mainly due to increase in most of the staple crops. In the receipts of domestic produce the city was well ahead of the previous season. Of cotton, gross, it received 2,149,370 bales, as against 1,835,115 last year; of cotton seed, 2,800,794 sacks, as against 1,913,580. There was an increase in the receipts of bacon and hams, corn, coal, flour, hides, lard, cotton seed oil, potatoes, rice and many other products. The total amounted to $193,147,121, as against $178,704,621, an improvement of $14,442,500, or over 8 per cent. In 1882–83 and in 1880–81 this season's receipts were exceeded, but in no other year since 1870. The foreign trade shows even greater improvement. There was a slight reduction in imports, $14,225,400, as against $15,446,121 in 1889 and $11,558,562 in 1888; but the exports grew from $82,924,882 to $108,294,736, an increase of $25,369,054. Total foreign trade, $122,520,136, against $98 371,007 last year, a very handsome improvement. The number of vessels clearing was 1224 of 1,413,864 tons, as against 1001 of 1,163,892 tons in 1889. This improvement of 23 per cent. in the tonnage of the port is the best of the kind New Orleans has ever witnessed, and this despite damage by the floods.

The steel steamship Mackinaw, built for the Saginaw Steamship Company, of New York, was launched from Wheeler & Co.'s yard, at West Bay City, Mich., on the 11th inst. It is about 300 feet over all, and can carry 3420 tons dead weight, coal included. Delivered it will have cost $200,000, $8000 of which it will cost to get it there. At Buffalo it will be cut in two to permit it passing through the Welland Canal. At Montreal the two halves will be riveted together and the boat will proceed on its course. A sister ship of the Mackinaw will be completed about November 1.

One of the largest cotton planters in the world is James S. Richardson, of Louisiana, whose plantation comprises nearly 40,000 acres, worked by 9000 negroes. Fully 20,000 acres are under cultivation, yielding about one bale to the acre. Each acre produces an average of $56 in cotton and seed.

Modern Blast Furnace Construction.—II.

JAS. L. WHITE, PITTSBURGH, PA.

(Continued from Page 408, September 11.)

As soon as it can be done, the location of the railroad tracks most likely to be used in conveying stone and excavated material should be begun, and these tracks put in. Teaming will thus be saved and material, as it arrives, be put close to its final location, especially the heavy iron work such as boilers, blowing engine machinery, &c., and the heavy sticks of timber used for the framing of trestles, and stock house, engine house, roof, &c.

In the furnace plan now being considered, the next important foundations are those of the regenerative hot blast stoves, and it is understood that these in this case will be in a line at right angles to the center line of hoist tower, furnace, stack and cast house. Stoves about 20 feet in diameter will require a foundation about 23 feet in diameter each, unless, as is done in some cases, an oblong foundation is made, including space sufficient for all the stoves. These will be placed from 23 feet to 25 feet from center to center, and three stoves usually seem to be enough, although some plants have four, some double plants having seven, and the Ensley plant, of four furnaces, having sixteen. The distance of the center line of these stoves from the center line of furnace stack, if produced parallel to them, will be regulated by the distance from the stock house back of them, and the width of the waste gas or chimney flue, passing between the stoves and the retaining wall before mentioned. Four feet inside width is usually enough for this flue, and the wall thicknesses make 6 feet 3 inch, with, say, 5 feet to inside of retaining wall, for a solid mass to hold the flue arch, leaving a distance from the inside of the retaining wall to the center line of the stoves of 22 feet 9 inches, or 23 feet. The distance from the center of the hoist tower and furnace stack to that of the nearest stove will be hardly less than 34 feet, and any greater distance involves greater length of hot blast main, gas main, and waste of space, unless for some reason the hoist engine house must be placed between the hoist tower and this stove. Less distance than 34 feet will cramp the space about the furnace columns and stove valves, detailed plans of which should be got up before attempting to locate them on the plan, so as to provide for all contingencies afterward, and avoid, say the ugly crooking of a hot blast main noticeable at a plant otherwise well designed. Afterthoughts are very expensive, indeed, at a furnace plant. If an underground gas flue is determined upon it will be put in along the front of the stove foundations, but not so deep as these are, the nature of the ground determining this depth, as usual. But care must be taken, next to that exercised in the stack foundation, to get a solid bed to start on; concrete is good, rock the best to begin upon, remembering that there will be some 650 tons of material supported by each foundation. The rubble should be laid in cement, topped by about 18 inches of good hard burnt red brick, also laid in cement. A depth of 10 feet will usually be sufficient if on rock or similar solid ground, but beware of a slanting bed of any kind to build upon. The greatest care must be taken to make the bottom level and true to commence with. The brick facing of the foundation must be perfectly level and solid, to make a true bed for the bottom plates of the stove. I have twice seen stoves badly out of line from the settling of foundations, once owning to an economical idea of using a bed of dry broken stone, causing a bad crack in the foundation after a heavy rain. No especial care is needed in the flue foundations, beyond securing drainage, true bed and line.

The next foundation in succession beyond the stoves is that of the draft stack or chimney. This, for a 17 x 75 feet furnace, is generally about 10 feet inside diameter, and the foundation is 24 to 25 feet outside diameter. There are usually eight heavy bolts holding down the base ring of this stack, about 18 feet long, or even longer, passing through a heavy foundation plate bolted up to form a complete ring, so that the excavation must be at least of this depth. The stack is about 180 feet high, as often made, though this size of stack is used for a double plant in many cases, but I am certain from observation that it is not sufficient for this latter instance. A high wind gives a tremendous leverage to such a column, hence the heavy foundation and long bolts used. The center of the draft stack will be not less than 24 feet from that of the last stove, if on the same line with the stoves, which is about its location, this giving a convenient place for the entrance of the waste gas flue from the rear of the stoves, coming into the stack with a fair curve between two of the foundation bolts, usually at an angle of 45°, while at the opposite side will enter the waste flue from the boilers. This foundation is hollow, about 13 feet being necessary for the lining and expansion space. The rubble stonework should be laid with flat bed stone entirely, or in place of it, hammer dressed beds should be used, and cement. It is not usual to arch over the flues in the foundation with stone, only with the continuation of their regular fire brick arches, the base ring of the stack itself doing the rest.

No exact set of rules can be laid down for the building of foundations, but practical experience suggests many ways of taking advantage of existing circumstances, and while there are some situations chosen which absolutely need certain methods of treatment, it is a good rule to avoid any, if possible, that need piling or very deep excavation. A poor class of rubble work, especially that which will not allow of good bond between the stones, should be avoided wherever any weighty structure is to be placed on the foundation about a furnace. Heat is a factor, and also, occasionally, heavy explosions, causing heavy shocks to masonry. No limestone should enter into the foundation of a furnace stack, being more liable than any other stone to be destroyed by a "break out" or a "salamander."

If the boiler settings are placed facing the stoves (as they are quite often located now) and extending parallel to their center line beyond the chimney, we will consider that they are set on a stone foundation, with walls about 30 inches wide, as a general rule, having a projection some 6 inches beyond the actual brick wall of the setting itself, no matter whether a cylinder boiler or flue boiler is used. Multitubular boilers, or those of other types of tube construction, have not been an unqualified success under my observation at furnaces so far. The extra care to be taken of them cannot be got from the class of labor generally found at Southern plants. Therefore I will consider that the simplest is taken in this instance—that is, the cylinder or "elephant" class of boiler, and this boiler is generally used in nests of four, side by side, two of which are rather closer together, giving space for a dividing wall between them and the next two, which wall needs a foundation down the center similar to the two side walls and end walls. There are excavations needed for waste gas flues, communicating with the chimney, of course, but these do not need any special foundation as a rule. The level of the boiler foundations is usually that of the hearth, though this is not absolutely necessary, but the stove level should be about a foot above the hearth level, especially if close to the furnace stack, so that no harm is likely to happen to the sheet iron in case of a break out. In some cases the blast engine house is next beyond the chimney, and in others directly behind the boilers, say 20 feet. In this case a convenient steam pipe arrangement can be made, avoiding long pipes, with all the trouble from expansion and condensation. This expansion difficulty gives a great deal of annoyance at furnaces where it has not been most carefully provided for, and short connections with free right angles are of advantage. This way of locating the engine house is good on that account and because it offers free room for additional boilers or engines and house extension.

If the engine house is located in front of the boilers in such a way that gas can leak into it from the underground gas flue, if such is used, much inconvenience is suffered at certain times by the men who run the engines. This gas is very liable to penetrate through to the cellar of the engine house, and it can be smelt in many engine houses that I know of where these flues are in use. The foundations of the engine house walls do not differ much from those of the cast house, but the engine foundations themselves are very important. Two blowing engines may do, but a spare one for an emergency will very often pay for itself, so that for this size of furnace it is well to count on three foundations for vertical blast engines, say 75 tons weight, bed plate 7 feet by 14 feet, needing a foundation about 9 feet by 22 feet at base, deep enough to be on solid ground and to take bolts 12 feet long. It is customary now to build these foundations of hard burnt bricks laid in cement, and well bonded all through, the bolts being placed in square wooden boxes, or better, pieces of old boiler flues, 3 inches in diameter or more, so that if necessary a bolt can be taken out at any time after the engine has been erected, which cannot be done if the bolts are built in solid. Pockets also should be left in the foundation under the washer plates, say 15 inches wide by 12 inches deep, to reach the keys or nuts at the bottom of the bolts at any time.

The most important part of the materials entering into the building of a blast furnace, after the foundation, is the fire brick lining, which is required to stand the intense heat of the smelting of iron, the abrasion of the charge, the solvent action of the limestone flux, which, at the high temperature of the melting point of the stock, gradually cuts away the silicious lining, and with certain kinds of fire brick, the action of the gases generated in the process, this last varying greatly with regard to the composition of the ores used. The chemical composition of the fire brick usually found best suited to withstand this solvent action, and action of gases will be treated of later on, and the technical considerations only taken up at this time. In the older furnaces, the so-called "lines" were deemed of the greatest importance, and much mystery was made of them, some furnace managers seeming to think that the whole success of the business of their particular furnace depended upon the secrecy that they maintained concerning the shapes used in the contour of the inwall. Of course, there was, in some cases, something in this of importance in the old method of working, but now, in fast driving, the shape of the furnace has been arrived at very closely, when the materials forming the stock have been specified; hard strong coke, and ores similar to those of Lake Superior, that is, rich in iron, moderately refactory, and not too liable to become pasty, and cause scaffolding in consequence, allowing

the use of a very acute bosh angle, and consequently, high "bosh" or largest diameter of furnace, inside lining. In some cases this is over one-third of the hight of the stack, even nearly half its hight. But in the use of soft ores, friable coke and inferior blast engines, a more obtuse angle of bosh is used, following, or rather approaching, the o'd cold blast charcoal iron practice. Serious difficulties have occurred quite lately in furnaces that I know of, built with too sharp bosh angles for the stock. In one case, this combination occurring with an ore like small gravel, that had worked well in a charcoal furnace of small hight. Much of the coke was not larger than a hen's egg, causing a registered blast pressure of 18 pounds per square inch, and as the mercury then overflowed the gauge tube, it was no doubt more. There were scaffolds and sudden drops that drove the melted stock into the tuyeres, explosions that almost filled the downcomer, a blowing out of a botted tuyere plug that struck and killed a man who was at work near it at the time it blew out, and a general racking and straining of the material and machinery of the plant, besides the temper and patience of the men in charge, who had not been consulted in any way in the design or construction of the plant, and who were consequently not responsble for the trouble. A lower furnace and smaller bosh angle would have been proper in this case, or no attempt should have been made to use the stock.

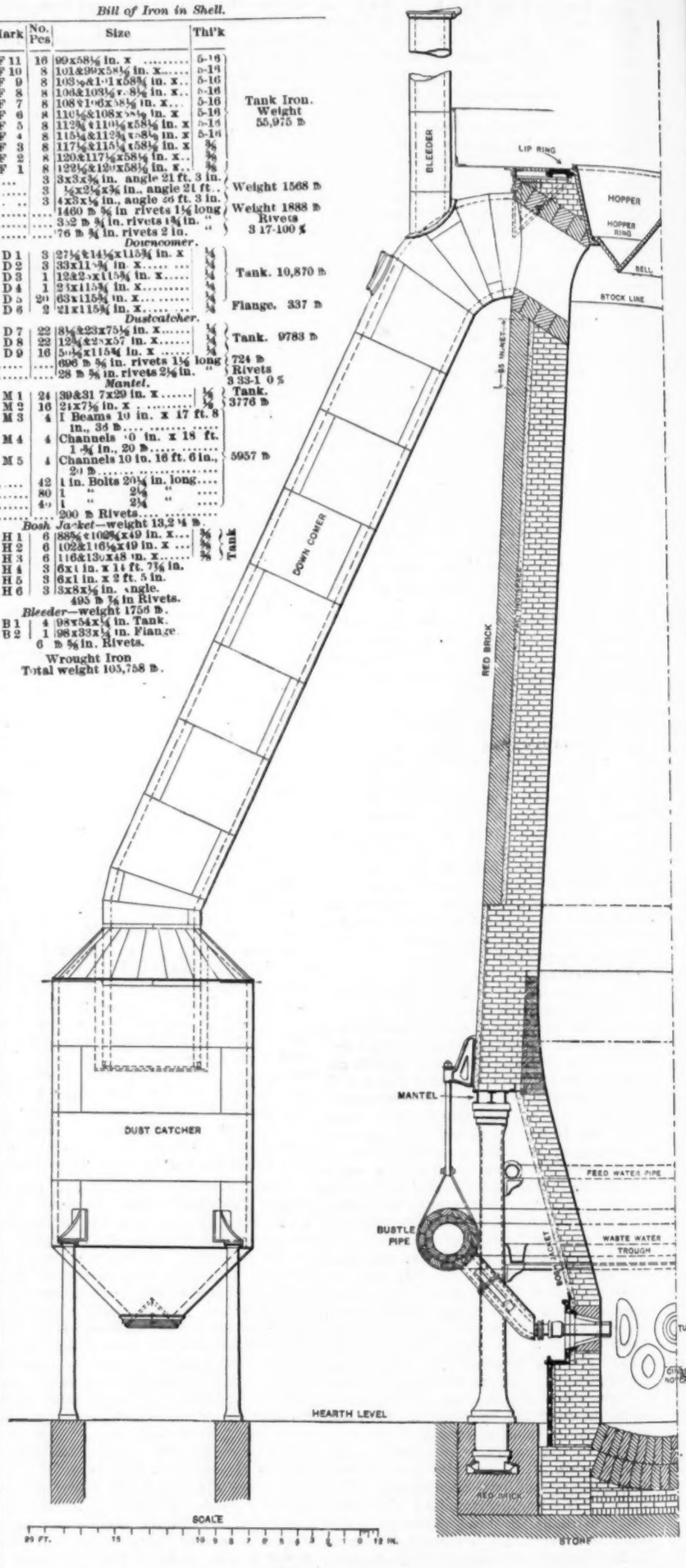
The hearth or actual bottom of the furnace stack is now generally made thus. Some 4½ or 5 feet below the intended hearth level, a course of best qualty hard burnt fire brick is laid on the level stone work on edge, or "rowlocks," as bricklayers term this method, then crossing at right angles to this another course is similary laid, taking, in all cases from the start, the greatest care that only perfect bricks are used, and that they are merely dipped in a bucket or tub of fire clay grout, then laid and driven up as close together as possible. On no account should the bricklayer be allowed to use the fire clay as he uses mortar or cement in the ordinary way of laying red brick, or fire brick in flues, chimneys and other situations not exposed to intense heat and the searching effect of highly heated molten iron at high pressure. The proper care used here is important to the last degree, since, if it is taken as indicated, a long life to the hearth is reasonably to be expected, otherwise it is pretty well certain that the hearth will fail soon, endangering the whole structure of the furnace stack. There is an important point to be mentioned here, namely, that the greatest care must be taken to keep all furnace lining and stove lining bricks perfectly dry under cover from rain or snow, and well above storm water or dampness, from the time they leave the kiln until they are laid in their intended places. The fire brick manufacturers can be depended upon to ship them in good condition in this regard, but I know of a case where a furnace was lined under the superintendence of an extremely scientific, but it would seem unpractical, manager, with certainly damp bricks. The stack was not properly dried out before blowing in, and some 16 feet of the top of the lining went into a sort of paste soon after the blast was put on the furnace. That gentleman is not at that furnace now.

In the laying of these bottom courses at least time should be taken between each course to allow the one previously laid to become throughly dry, and it is always best to commence lining a furnace in warm dry weather—summer, if possible. Artificial heat, generally, is not easy to regulate, and cracks in the hearth may be formed, these offering sure passage sooner or later to the fluid iron. Sometimes

Bill of Iron in Shell.

Mark	No. Pcs	Size	Thi'k	
F 11	16	99x58⅛ in. x	5-16	
F 10	8	101⅛99x58⅛ in. x.....	5-16	
F 9	8	103⅛&101⅛x58⅛ in. x..	5-16	
F 8	8	106⅛&103⅛x58⅛ in. x..	5-16	Tank Iron. Weight 55,975 ℔
F 7	8	108⅛&106⅛x58⅛ in. x..	5-16	
F 6	8	110⅛&108⅛x58⅛ in. x	5-16	
F 5	8	112⅜&110⅛x58⅛ in. x	5-16	
F 4	8	115⅛&112⅜x58⅛ in. x	5-16	
F 3	8	117⅛&115⅛x58⅛ in. x	⅜	
F 2	8	120⅛&117⅛x58⅛ in. x..	⅜	
F 1	8	122⅛&120x58⅛ in. x..	⅜	
....	3	3x3x⅜ in. angle 21 ft. 3 in.		Weight 1568 ℔
.....	3	⅛x2½x⅜ in., angle 21 ft.		
.. ..	3	4x3x¼ in., angle 26 ft. 3 in.		Weight 1888 ℔
.....	....	1460 ℔ ⅝ in. rivets 1½ long		Rivets
.....	....	352 ℔ ⅝ in. rivets 1⅜ in. "		3 17-100 %
.....	....	76 ℔ ¾ in. rivets 2 in. "		
		Downcomer.		
D 1	3	27½&14½x115¾ in. x	¼	
D 2	3	33x11⅝ in. x..... ...	¼	
D 3	1	12&2x115¾ in. x.....	¼	Tank. 10,870 ℔
D 4	1	2½x115¾ in. x.....	¼	
D 5	20	63x115¾ in. x.....	¼	
D 6	2	21x115¾ in. x..... ...	¼	Flange. 337 ℔
		Dustcatcher.		
D 7	22	81½&23x75½ in. x.....	¼	
D 8	22	12¼&2½x57 in. x.....	¼	Tank. 9783 ℔
D 9	16	50½x115¾ in. x	¼	
.....	....	696 ℔ ⅝ in. rivets 1½ long		724 ℔
.....	....	28 ℔ ¾ in. rivets 2¼ in. "		Rivets
		Mantel.		3 33-1 0 %
M 1	24	39&31 7x29 in. x.....	¼	Tank.
M 2	16	21x7½ in. x	¼	3776 ℔
M 3	4	I Beams 10 in. x 17 ft. 8 in., 36 ℔.....		
M 4	4	Channels 10 in. x 18 ft. 1 ⅝ in., 20 ℔.....		
M 5	4	Channels 10 in. 16 ft. 6 in., 20 ℔.....		5957 ℔
.....	42	1 in. Bolts 20¼ in. long....		
.....	80	1 " 2½ "		
.....	40	1 " 2¼ "		
.....		200 ℔ Rivets.....		
		Bosh Jacket—weight 13,2¼ ℔.		
H 1	6	88⅝&102¾x49 in. x...	¾	Tank
H 2	6	102&116⅛x49 in. x ...	¾	
H 3	6	116&130x48 in. x.....	¾	
H 4	3	6x1 in. x 14 ft. 7½ in.		
H 5	3	6x1 in. x 2 ft. 5 in.		
H 6	3	3x8x½ in. angle.		
		495 ℔ ⅞ in Rivets.		
		Bleeder—weight 1756 ℔.		
B 1	4	98x54x¼ in. Tank.		
B 2	1	98x33x¼ in. Flange		
	6	℔ ⅝ in. Rivets.		

Wrought Iron
Total weight 105,758 ℔.



SECTION OF BLAST FURNACE.

there are several courses of rowlocks, and enough courses of bricks laid flat to bring up the level to 3 feet below the hearth, so as to start the two final courses of bottom blocks laid on end, if this construction is used. Sometimes there is another kind, long plain "squares" being used, set on end, and the advantage in this is that no specially molded bricks are needed, as blocks are. Therefore there is no trouble from bricks being short or broken or lost, the quantity required being selected from the general stock. They are usually 13½ inch, 11 inch and 9 inch, each 4½ x 2½ inches in their other dimensions. The blocks used are 18 inches high, and are molded so as to form a series of rings around a center block, the top of which is 6 inches in diameter. They are also made so as to be in the form of a dish or basin when laid close, the depth at the center of a 10-foot or 10-foot 6-inch hearth being about 12 inches below the hearth level, that is, the base of the crucible wall. The courses are 6 inches wide in each ring, eight blocks to the first course, and the blocks of each succeeding course being of about the same size as these. These are all of the first quality fire brick, each ring being made from a different mold, and they are expensive in first cost and expensive to lay, as each course must be kept separate. There should be also a certain amount of spare bricks to each course, to provide for breakage, &c., and these, if not needed, are not of much use in other constructions.

These two courses complete the hearth, which is to be understood as being built entirely separate from the inclosing wall of the furnace, although extending somewhat under the crucible wall. In all interstices, or spaces that would occur from irregular shape of the bricks near the circle wall, for instance, care must be taken to cut brick to a close fit, no thick clay joints to be allowed at all, because fire clay is not mortar, it does not "set," but simply dries, and like other clay, shrinks as it dries, leaving in all cases cracks. The more clay used the larger the cracks. Construction alone is to be depended upon for "bond" in all cases, and space is to be allowed between separate walls for expansion of the hot brick, which space is often filled with dry sand, as free as possible from everything but silica.

The thickness of the wall of a crucible with a 10 foot or 10 feet 6 inch hearth, is usually not less than 32 inches for a hight from the hearth level of some 3 feet 9 inches, and 18 inches below it of first quality fire brick. These are laid in circles, concentric and breaking bond with each succeeding course. The bricks used here and upward are mostly of a shape widening from the center or interior of the circle outward and are called "keys," being usually of two lengths, 13½ and 9 inches, 2½ inches thick and from 4 to 4½ inches on the inside circle in width. These are alternated with one another and with "squares," as parallel bricks are called, so as to form the varying circles of the wall closely enough for practical purposes. As few bricks should be cut in these walls as possible, the trimming off the hard burned face of the brick materially affecting its durability from the coarse granular structure of all high quality fire brick. Above this hight the wall is now made thinner, 18 or 22½ inches thick, as here the openings or "arches" are made for cinder notch and, say 24 to 30 inches higher up, the tuyeres. The cinder notch often cuts into this lower 32 inch wall about half its diameter. The upper half in all cases, and the whole circle in many of these openings, which taper from the outside toward the center of the furnace, are arched with specially shaped brick blocks, the same care about joints and close work being necessary. A furnace must be lined slowly. Time taken now means iron in the future. This 18 inch wall is carried up to a point slightly higher than the tuyere arch tops, centers of tuyeres being generally 5 feet 6 inches from hearth level, to enable a man of ordinary hight to inspect them easily at all times, and changes to be made in them without blocking up during working.

From this point above mentioned the slope or angle of bosh commences, and a center bar of iron is usually set up so that it can revolve freely on its axis, remaining plumb, to which is attached an outrigger carrying a slanting "sweep" by which to lay the courses of bosh. On the outside of this slanting wall there is usually a strong sheet iron jacket where cooling plates are not built into the wall. Where these are used instead of a jacket, plenty of water being at hand, a series of wrought iron rings from ¾ to 1 inch thick by 6 inches wide, are placed at intervals of 2 feet or more from the commencement of the slope, leaving space for doing work about the water pipes of the cooling plates. These are built in carefully and are of various patterns, the inside ones being set from 9 inches to 4½ inches from the inside of the wall, with the intention of gradual withdrawal as the lining burns out; that is, those which are movable at all. They consume a great amount of water and need close watching or they become clogged and useless. Their object is to preserve the shape of the bosh wall.

There is another method of doing the same thing; that is, by the use of coils of pipe between the bosh jacket and the brick work, and there are several patented cooling devices besides. The brick is built to within a few inches (3 inches is enough space) of the jacket or the pipes, and the space is filled with some substance that will slowly yield to a crushing force to provide for the expansion of the brick by heat. At the level of the mantel the outside of this lining wall is either taken up vertically, or the slope is reversed so as to bring the lining to a 9 inch course at a hight from 8 to 10 feet above the mantel, and at this hight is usually the largest diameter of the bosh. This is as high as it is generally necessary to go with first quality fire brick. The amount of this brick used is about 30 per cent. of the total amount in the lining of a 17 x 75 foot furnace stack which takes altogether about 163,000, first and second quality together. The cubic capacity of the lining in feet multiplied by 15 will give a fairly close approximation to the amount of fire brick needed. On the top of the mantel courses of brick are laid independent entirely of the first quality brick, though touching them at the interior, and overlapping the last course of them, then continuing to the stock line some 8 or 10 feet below the top of the furnace stack.

The thickness of the lining of the bosh jacket is generally about 18 inches as now built, some people using 21½ inches, however, and the thickness at the widest part of the shell at the mantel is about 3 feet 3 inches. But after 12 or 14 feet above the mantel, 27 inches will be sufficient for the thickness of second quality brick, the space between this and the shell being filled with red brick, care being taken to leave a 3-inch packing space for expansion. This packing often gives trouble, and I saw a furnace once lined with mineral wool in the space, which leaked gas soon after being blown in, and this gas burning caused the mineral wool to run out in a molten shower for a day or two. I do not know how the lining got along after the packing went. Moderately porous cinder or "slag" is often used, and even dry loam. I believe improvement is still to be made at this point, as there are a number of furnaces with strained or burst shells, the bricks evidently having expanded outward as far as they could go.

The fire brick order for a furnace should be got out about the first thing, if possible, because it takes some time to make the bricks, and high quality bricks are always in demand. The bricks at the downcomer are often made in blocks to shape, for which a drawing must be made, but if not, side arch bricks are used, the opening starting at about the stock line, then sloping upward at an angle of 30° or so, to insure that stock shall not roll into the downcomer. The lining becomes dome shaped above the stock line and meets the edge of the cast iron hopper, then follows it upward to about 6 inches from the platform, care being taken to allow 6 inches vertical distance from brick to any brackets or projections that the rising brick may meet when the furnace is blown in, and expansion takes place from heat.

There is need for a carefully made drawing of the furnace stack, showing the lining properly coursed, and the way it is intended that the bond is to be made in the brick, although many furnace managers will not go to the trouble to do this, merely sending a sketch or tracing of the boundary lines to a fire brick manufacturer and allowing him to supply the brick at his discretion. This course accounts for the surplus brick generally found after a furnace lining has been ordered, and at $28 a 1000, 5000 or 10,000 bricks over the amount needed cost more money than a drawing would have done. The kind of bricks that thus are in excess are not of great use in other parts of modern furnaces. In fact, there is a furnace within a short distance from here where such bricks seem to have been utilized as pavement only. A common 9 inch fire brick weighs about 7 pounds, has about 100 inches cubic content, and 1000 require about 750 pounds of fire clay to lay them. I will give tables later containing the sizes and numbers of each kind of brick necessary to lay courses of different diameters, and tables of arch brick used in horizontal flues, most of which however can be taken, if needed, from catalogues of the various brick manufacturers, some of whom publish quite complete lists of these.

The downcomer, or gas flue leading from the top of the furnace downward to gas stoves, boilers, &c., is lined usually with 4½ inch circle brick, and that for a furnace 17 x 75 feet will be about 6 feet inside diameter of sheet iron, no space for expansion being allowed for, however. There are several designs of downcomer, and indeed in some cases a separate downcomer is used for stoves alone, but with the kind of plan now being described and which will be illustrated in the drawings accompanying this series, in which economy of first cost is sought for as well as high efficiency, only one will be considered—that one leaving the furnace shell on the side nearest the stoves and boilers. This insures a straighter set of gas flues and less travel for gas, less weight of material and less cost.

Owing to various causes there is always more or less dust carried down by this gas, and this dust is made up of powdered ore, coke, perhaps lime dust and fumes of various substances; in the South in many cases consisting largely of zinc compounds sublimed by the heat. Mere dust gives but little trouble, as it is carried down to the enlarged part of the tube near the bottom, called the dust catcher, usually double the diameter of the downcomer, and here, as the travel of the gas is immediately partially arrested, time is given for much of this dust to drop out of the gas and accumulate near the cleaning door or bell, as the case may be, whence it is periodically removed easily, as will be shown in the details. The pipe of the downcomer should descend some two or more diameters into the dust catcher, and the sheet iron must be coated outside as well

as inside with fire brick to prevent injury to the iron from action of the gas. Quite lately a case came to my notice where such a tube unprotected had corroded away and fallen, lining and all, into the dust catcher, making this last of but little use, and causing trouble with all the flues from gas dust deposit. The inside of the vertical or sloping part of the downcomer is lined with plain circle brick as above stated, but the circle brick, if placed on the extension pipe coming into the dust catcher, would not remain on the outside of the pipe, but would fall down from expansion by heat, so it is usual to make such brick dovetailed at the ends to bind them course by course, and this requires special brick molds. All this must be provided for and detail drawings made. A high class quality of brick is not needed here, but it must be one able to resist action of gas.

If the furnace is to work on ores containing zinc, a change in the shape of the downcomer is of advantage. Where such furnaces have been provided with the ordinary curving top and sloping tube of downcomer, the action of the zinc deposit has been such as to often nearly close the downcomer, first making a lump at a point half way down the bend near the top, generally in a place out of reach of the explosion and cleaning door provided for the removal of deposit; then making a sort of rebound, the deposit occurs lower down, first on one side, then on the other, of the tube. This deposit is very hard and quite heavy, sometimes two or three extra cleaning doors have to be placed in the downcomer to remove this deposit properly. But if the tube is taken out of the furnace at a right angle, until with a bend of say 6 feet radius it can be brought vertically down to the dust catcher, there would seem to be less reason to expect deposit in the vertical part, and the horizontal and curved part could be very easily cleaned as they could be seen and got at from the cleaning door, or from two side cleaning doors near the bend, at most. This zinc deposit has become valuable as a by product.

From the dust catcher, the bottom of which it is well to make high enough from the ground to get a cart under to save shoveling the deposit, a tube leads out to the boilers, generally in a 17 x 75 foot furnace about 60 inches inside sheet iron, lined with from 3-inch to 4½-inch brick. The thin bricks weigh less, but cost just about as much per thousand and to lay, and if horizontal, in overhead gas flues, they are side arch brick. The tube for the boiler gas flue should be taken out from about its full diameter above the lowest point of the downcomer extension. There are explosion doors on top, and cleaning doors below the pipe at necessary intervals, and from this overhead flue tubes, also brick lined, descend to the fronts of the boilers. When the length of these tubes has been determined, the number of bricks can be ordered, so that it pays to do that also by the use of a drawing.

Ex-Mayor John A. Roche, of Chicago, is one of the promoters and incorporators of a new and somewhat unique enterprise—namely, the developing and handling of new inventions. The company which he represents is called the Molyneux Experimenting Company. Its object is to test, manufacture and put on sale new inventions. B. S. Molyneux is manager of the company. He is himself a successful inventor and has taken out many patents. The company expects to be able to put before the public many worthy inventions, which, for lack of money or other reasons, are now unused and practically unheard of. It will have a department devoted specially to testing inventions to ascertain their alue. It will also build shops for manufacturing such as are determined to be valuable. The greater part of the stock is held in Minneapolis, but the company will have its headquarters in Chicago and will have an exhibit in the World's Exposition.

Direct Process of Making Iron and Steel.

For some time past the Adams direct process for the manufacture of iron from the ore has attracted considerable attention in the West, having been experimented with at Indianapolis. Lately a furnace of this kind has been put up at the works of Park, Brother & Co., at Pittsburgh, where it has been placed directly above an open hearth furnace. The principle underlying the process is well shown in the patents recently granted, from which we take the following, although it should be stated that in some details the construction shown has been departed from :

The furnace A is built upon a foundation, B, which, as shown in the drawings, is rectangular and oblong, but may be any other convenient shape. The interior is furnished with checker work, C C′, of fire brick, arranged on each side and at the two ends, so as to leave a clear vertical space, D, from the top to the bottom. In this space the ore is changed and reduced. It is long and narrow, as shown in Fig. 2, and tapers upward in width so as to give the necessary clearance for the descent of the charge. This working space is closed at the top by a curved hopper, E, for the admission of the charge, and is closed at the bottom, preferably by being placed over a tightly closed reservoir, F, which forms part of the foundation. This reservoir is the receptacle into which the reduced ore is discharged from the working space of the furnace, and is provided with one or more inclined shutes, G, from which the reduced ore is removed from time to time, double sliding doors, *b*, being provided to each shute, so that one may be closed when the other is open, so as to practically exclude the air from contact with the hot sponge.

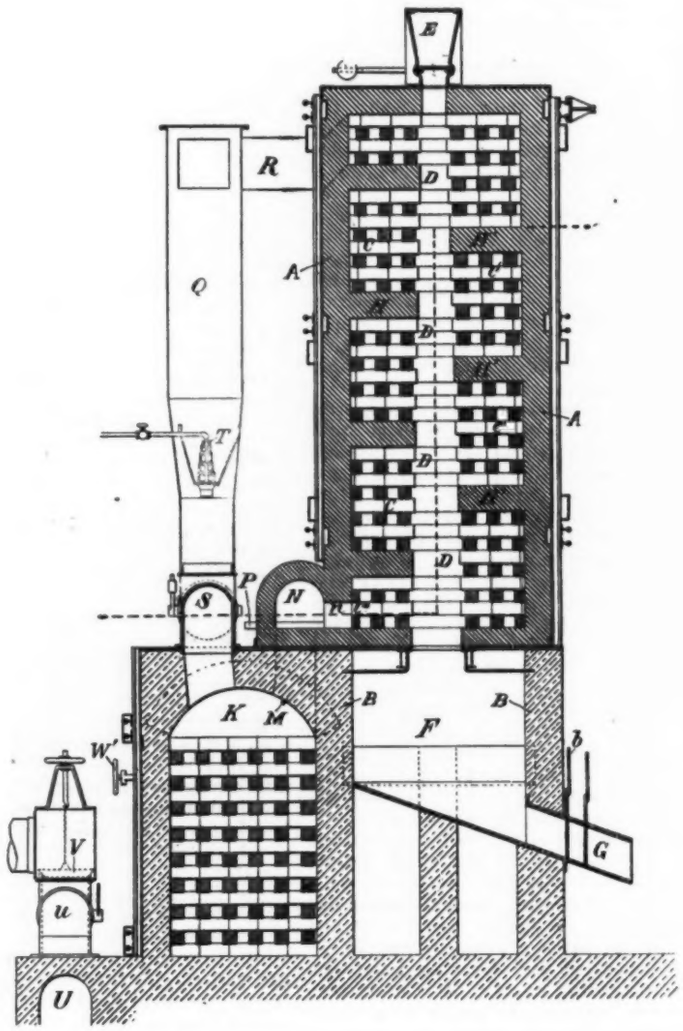


Fig. 1.—Vertical Section.

THE ADAMS DIRECT PROCESS FURNACE FOR MAKING IRON AND STEEL.

The checker work in the interior of the furnace is placed within a series of separate chambers formed by the horizontal shelves H, which extend from end to end of the furnace and from each side of the central working space. The shelves on one side of the space are not on the same level as those on the other, one shelf being placed about midway between the two opposite ones.

Below the furnace are two regenerators, K K′, fitted with brick checker work in the usual way. These regenerators are connected by uptakes, M, with a horizontal flue, N, which extends the whole length of the furnace and connects by numerous adits, *n*, with the checker work C^2 in the lowest checker work chamber of the furnace on one side, as shown in Fig. 1. Valves, P P′, made of fire clay tile, are connected with the flue N, by which the re-

generators K K′ are alternately connected with the checker work C^2 in the lowest chamber in the interior of the furnace. A short horizontal flue, R, connects the topmost of the checker work chambers, C, of the furnace with a downtake or draft flue, Q, which conveys the gas as it leaves the furnace downward to one of the regenerators, through the butterfly valve S, which can be set so as to admit the gas from the top of the furnace into either of the regenerators, the valves P, P′ and S being reversed from time to time, so that when the regenerator K′ is in connection with the furnace the other regenerator K is connected with the downtake flue Q, and *vice versa*. A steam ejector, T, placed in the downtake Q, determines the direction of the draft downward from the top of the furnace A to the regenerators and regulates its amount and velocity. A flue, U, connects both of the regenerators K K′ with a stack or chimney to carry off the products of combustion, and a valve, *u*, according as it is set, connects

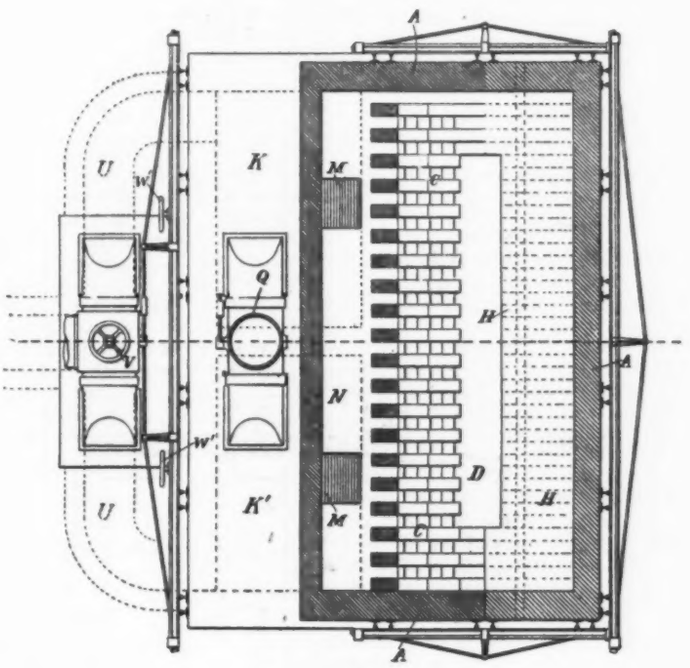


Fig. 2.—Sectional Plan View of Furnace.

one or other of the regenerators with the flue or chimney.

The reducing gas by which the ore is to be reduced may be either carbonic oxide (CO) or hydrocarbon gas or vapor, which is prepared in a separate gas producer of any desired construction. If carbonic oxide is used, the common Siemens gas producer may be employed; if by hydrocarbon gas or vapor, it may be manufactured in any suitable apparatus, or may be simply a vessel charged with petroleum or other liquid hydrocarbon, and heated sufficiently to vaporize it. V is a valve for admitting the carbonic oxide or hydrocarbon gas or vapor from the producer to one or other of the regenerators K or K′, according as the valve V is set. The spout of the shute G is extended by a moveable spout, so as to conduct the hot sponge or reduced ore direct from the reservoir into an open hearth furnace, W, previously provided with a charge of molten bath metal.

When the furnace is first used, or when first used after having been emptied of its charge, the reservoir F may be filled up to the bottom of the working space D with ore, coke, coal or wood, or other suitable material, which will not injure the reduced iron by its slow combustion, and which will serve to sustain the burden of the charge of ore. The ore to be reduced is then charged into the furnace through the hoppers E. The ore before being introduced may, if desired, have mixed with it a small quantity of some carbonaceous solid, such as coke, coal, charcoal, &c. It has been found advantageous to use for this purpose coke to the amount of 10 to 15 per cent by weight of the charge of ore. The working space D is filled with this charge from top to bottom, and if a continuous process is desired the working space is kept filled up with ore (or ore and carbon) as the reduced ore gradually passes away below. Before commencing the operation of reduction the regenerators K K′ are both heated to from 800° to 1200° F. The supply pipe of the ejector T is connected with the live steam space of steam generator, the hopper E is closed, as also the sliding doors *b* in the shute of the reservoir F, so as to exclude as much as possible the external air from the interior of the furnace, and the valves S, P and V are set so as to connect one regenerator, as K, with the flue N, and thus with the lower chamber C^2 of one side of the furnace A. The valve is set so as to connect the same regenerator K with the gas producer, and the valve S is set so as to connect the downtake Q from the top of the furnace with the other generator K′. The apparatus being thus adjusted, the carbonic oxide gas from the gas producer enters the flue and thence passes up through previously heated checker work in the regenerator K and becomes thereby heated to a temperature of from 800° to 1200° F., and thence arises through the uptake M into the flue N and enters the lowest checker work chamber C^2 at one side of the furnace through the adit *n*, heating the checker work in the furnace as it traverses it. As the gas finds no passageway upward, being obstructed by the partition or diagram, H, it passes sidewise with the mixed ore and carbonaceous matter at the lower end of the working space D. Here its upward passage through the superincumbent charge of ore being difficult, the gas, following the path of least resistance, enters the lowest of the chambers C′ on the opposite side of the furnace. Here it rises through the checker work until it meets the obstruction of the first partition of that side of the furnace, which is at a higher level than the first partition on the other side, and is forced to pass again sidewise into the charge of ore, &c., in the working chamber D, and, again taking the path of least resistance, it enters the checker work on the side of the furnace at which it first entered, but into a chamber higher up, and thus the reducing gas is compelled to follow a zigzag course backward and forward through the column of ore in the working space D until it reaches the horizontal flue R, through which it enters the downtake Q and passes down through the valve S, set to conduct it into the other regenerator K′. Here the gas meets and combines with a current of atmospheric air admitted in any desired and regulated quantity to secure complete combustion by means of the valve W′, communicating its heat to the checker work in the regenerator. The products of combustion thence pass off through one of the flues U and valve *u* to the stack or chimney placed at any convenient point. The downward draft through the downtake Q, and consequently the upward current through the furnace A, is secured and regulated by the ejector T, situate in the downtake Q.

In order to preserve the required uniform temperature of gas passing through the furnace, the regenerator valves should be shifted every 10 or 15 minutes, so as to turn the supply gas from the producer into the regenerator, which has just been heated up by combustion of the escape gas from the top of the furnace, and thence through the valve P and flue N into the bottom of the furnace, and to change the course of the escape gas from the top of the furnace through the downtake Q by the valve S into the regenerator through which the supply gas has just been passing.

The reactions produced are as follows: The heated reducing gas (carbonic oxide) passing through the body of the ore in the working space of the furnace effects the deoxidation of the ore. The oxygen liberated from the ore has a tendency to combine with the carbonic oxide (CO) and form carbonic acid (CO_2), the presence of which would arrest the deoxidation of the ore; but this tendency is counteracted partly by the carbon when used mixed with the charge of ore, but chiefly by the constant access from the gas producer or source of supply to the interior of the furnace of fresh carbonic oxide or hydrocarbon gas or vapor preheated by passage through one of the regenerators and by the heat of the furnace, which is such that carbonic acid cannot exist in the presence of carbon. Furthermore, the desired degree and uniformity of temperature of the reducing gas is maintained within the furnace by the heat communicated to and stored up by the checker work in the several chambers of the furnace, which absorb and take up any excess of heat of the incoming gas which may occur, as in case of the reversal of the valves turning the gas through a freshly heated regenerator, and give out this stored up heat to the gas when its temperature is reduced by the cooling of the regenerator previous to such reversal, and thus the reducing quality of the gas as well as the necessary uniform degree of heat is maintained throughout the furnace and during its entire operation.

The result so far as described is the production of deoxidized iron ore, called "iron sponge." As this is formed without fusion the pieces do not adhere together, but preserve very nearly the size and shape of the pieces of ore charged into the top of the furnace. In consequence of the reducing gas passing back and forth through the charge of ore repeatedly before it escapes at the top of the furnace and being unable to rise up directly through the charge, the ore is very thoroughly treated, and as the gas after each passage across the working space through the ore is compelled to enter the checker work before returning, its temper-

ature is regulated and rendered uniform. The iron sponge thus produced drops down gradually into the reservoir, which, extending under the entire length of the furnace, will hold a large amount of sponge. The doors *b b* being closed, the sponge is substantially protected from the access of external atmospheric air, which would rapidly oxidize the sponge, especially when in a heated condition.

In order to effect the conversion of the iron sponge into steel an open hearth furnace is placed sufficiently near the reservoir to permit the conveying of the sponge by a movable spout into a prepared bath of molton carbide of iron in the open hearth.

This apparatus is the invention of Chas. Adams, of St. Louis, Mo., and has been thoroughly tested at the Premier Steel Company's works, at Indianapolis. The superintendent of the works, Samuel Morris, describes the furnace there in use as having a reducing chamber of the following dimensions: Vertical cross section, 3 feet 6 inches below, 12 inches at top; length, 16 feet; hight, 15 feet, with a top chamber 5 feet high, same length and width as above given and 12 inches across, for drying out the ore before entering the reduction chamber proper. The latter will hold ore of 65 per cent. (and the necessary admixture of coal), sufficient to give 20 tons of metallic iron. From a description of the furnace by Mr. Morris we take the following: "The reduction process requires five hours, so that the producing capacity of the furnace is about 100 tons of wrought iron per 24 hours. To produce this it requires 6 tons of producer coal, 16¼ tons of coal intermixed with the ore and $84 for the labor, repairs, &c., employed, making a total of $1.04 per ton over and above the cost of the ore. As nothing higher than a red heat is employed, the iron remains in mechanical admixture as originally distributed through the mineral, but chemically it is the only one of the original components of the ore that has been deoxidized; hence it not only has no chemical union with, but also no chemical affinity for, the silica and the phosphoric acid of the ore, and when the sponge is immersed in the bath of the open hearth furnace those bodies are fused into a slag, which we tap off before the carbon of the bath has time to reduce much of them to silicon and phosphorus and thus enable them to combine with the iron.

"There is nothing new in the attempt to get iron sponge to use in open hearth practice, nor in the conception that if it could be had readily upon a wholesale scale and at a cost of $1 or $2 per ton of iron in the sponge, exclusive of the cost of ore, it would make a superior quality of steel at a less price than the cheapest steel now made of any quality whatever. But no plan that has ever hitherto been put into practice has given us the sponge on these terms. It has been well known that red hot hydrocarbon gases deoxidize the native oxide of iron rapidly, but until the Adams process came in we have had no means of getting them to pass through large bodies of ore. Our furnace is provided with rows of spy holes at different levels, which make it easy to observe this action of the gases, especially if it be shut off and then suddenly turned on again for this purpose. We have no difficulty whatever in getting the gas to go through the ore, although we use the latter just as it comes from the mines, fine and coarse together."

LEATHER WOVEN LINK BELT.

Leather Woven Link Belts.

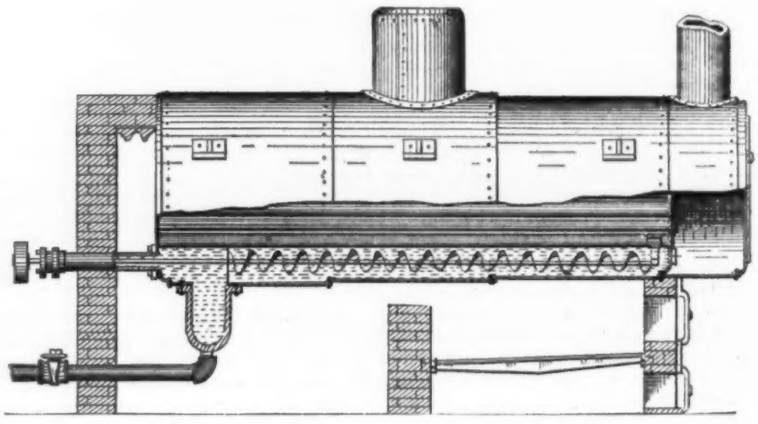
The engravings clearly show the formation of the leather woven link belt made by the Shultz Belting Company, of St. Louis, Mo. The links are of uniform size, and, being concaved, they form a belt which closely fits the face of the pulley. They are held together by leather or rawhide rods, which are tough, flexible, and of light weight, and at the same time secure the links as safely as iron or steel rods. Thus constructed, the belt is flexible laterally, lengthwise and in all its parts. As both sides are alike the belt can be turned when necessary.

Ex-Mayor Bullene, of Kansas City, claims that the city was never more prosperous than now. The bank clearings for 1890, January to July inclusive, were $288,014,767.08, being 12 per cent. greater than in the same months the preceding year. This shows that in a business way Kansas City is doing more per capita than any other city in the country. Last year 5000 buildings were erected at a cost approaching $9,000,000.

Water Circulator.

A new device for keeping the water in a stationary boiler in constant circulation has been patented by R. P. Fries, of Wichita, Kan. The circulation is caused by a screw similar to those used in grain elevators as grain conveyors. This screw lies on the bottom of the boiler and extends the whole length. The shaft of the screw is run through the rear wall of the boiler, and power for turning it may be applied by a sprocket chain, belt or other similar appliance, which can be attached to the machinery for which the boiler supplies steam. The movement of the screw or conveyor keeps the water in constant motion by taking it from the front and forcing it along the bottom to the rear, where it rises and flows on top to the front again to supply that forced in the rear. The free circulation prevents foaming and also prevents scale, and by keeping the mud from settling in the boiler prevents the plates from burning out.

The boiler is kept clean by washing the sediment into a mud drum placed under the rear end of the boiler. The conveyor carries the sediment to the rear, where it is swept and allowed to deposit in the mud drum, since the water in the drum is not agitated by the screw, but remains still. The mud can be blown out when necessary, and this will make it unnecessary to stop the engine to clean the boiler. It is claimed that this arrangement will save much expense in operating and much of the time usually consumed in cleansing the boiler of mud and scale. The conveyor has been working for some months in a boiler in the plant of the Electric Motor Car Line, of Wichita, Kan., and it has given very good satisfaction. The same principle can be used in marine and locomotive boilers by using a force pump to draw the water from the front of the boiler and admitting it to the bottom again.



THE FRIES WATER CIRCULATOR.

Americans are investing heavily in silver mines in Mexico, in order to profit by the high prices of the metal.

THE WEEK.

The smoke inspector in Cricago intends to suppress the blinding smoke that is blown ashore from steam craft plying on the rivers. An experiment was made last week to demonstrate the practicability of a new invention. The process consisted in introducing into the smokestack a small tube with a perforated top, like that in a sprinkling can, and through which, when desired, steam could be injected upon the uprushing smoke and so condensing it as to prevent its ascension. The little tube with its jets and spray of steam is not a smoke consumer, but of its utility as a smoke preventer, it is claimed, there can be no doubt.

The increase of freight traffic on the Ohio River affords gratification to steamboat owners at Pittsburgh, and predictions are made that the former prosperity of river transportation will be restored. Since the latter part of 1888 there has been no lack of water.

Four times fire broke out in the hold of the steamer Grecian, from London to Quebec. The cargo consisted of linseed oil and wool, exactly the combination to invite spontaneous combustion.

A large transaction in gas coke has been brought about in St. Louis by the Laclede Gaslight Company, who have contracted with one of the largest wholesale coal dealers in the city to place in their hands for delivery the entire coke product of the company for a term of years. The amount thus handled is 2,500,000 bushels annually, and an effort is making to induce consumers to substitute coke for hard coal, which is now retailed at $7.25 a ton.

A steamship line has been established between New York and Cadiz, to run under the Portuguese flag. It is believed that trade will be much increased.

Chinese immigration is the subject of complaint on the part of labor organizations in Canada, but Sir John Macdonald in reply to a delegation says it would be impossible for the Canadian Parliament to pass a law excluding Chinese, because it would be a question of treaty arrangement, and the Imperial authorities would not sanction it. Personally he believed it would be a great mistake, as the possibilities for trade with China were great and the chances of securing the same were good. Considering the action of the United States Government in excluding Chinamen, China might retaliate.

Putting binding twine on the free-list the Chicago *Tribune* says was equivalent to a gift of several million dollars to Western farmers, and the editor contends that a refusal to make cotton bagging free in like manner is an unfair discrimination against the South.

The Teutonic's quick trip last week brings the number of less than six day voyages up to 13. Her time was five days and 21 hours, lacking four minutes.

Land on Dey street, in this city, adjacent to the Western Union Building, has been purchased for $70,000. The price paid eight years ago was $32,000

The Japanese are becoming famous shoe makers, aided by American machines. In Tokio alone there are 100 factories usually managed by Chinese workmen, and goods are exported to China and Australia at very low prices.

It is understood that the Knights of Labor have levied a tax of 25 cents a week upon all members, in support of New York Central strikers. The "red letter" order enforcing it is said to imply urgency. The Locomotive Firemen appear to be much better provided with funds, judging from the fact that they propose to build a central headquarters at a cost of $150,000, although no longer ago than 1888 they were said to have expended nearly $500,000 to support the "B. and Q." strike. Perhaps they had something left over.

The farmers and workingmen who were made suddenly rich, in a Pickwickian sense, by the advance of silver to 120 less than a month ago, must now feel terribly impoverished with silver quoted about 114.

The proposed exploration of Alaska under the direction of the War Department will commend itself to business men. A territory of nearly 600,000 square miles in area is scarcely known beyond its maritime boundaries, and yet the so-called "Seward purchase" was made 23 years ago.

The president of the Cape Town Chamber of Commerce, L. Wiener, is now in this country to inspect American locomotives and decide upon their adaptation to new roads building toward the Zambesi River.

Engineer Bonzano, of the Phœnix Bridge Company, says that the report that the great Kinzua viaduct over the Erie Railway will be either abandoned or removed is only a rumor; that it shows no signs of weakness in any part. Under the loads thus far imposed the structure is strained not more than one-fifth of its ultimate strength.

Western Australia comprises a territory of more than 1,000,000 square miles—exceeding the whole territory of Western Europe. The entire population numbers scarcely 45,000 souls settled upon its maritime edges.

The depreciation of farm lands in Pennsylvania was made the subject of special inquiry by the Secretary of Internal Affairs of the Commonwealth, and in answer to a series of questions addressed to 600 prominent farmers much information was gathered. The general conclusion would seem to be that the railroad has not only failed to increase farm values, but that instead it has actually decreased them. The burden of complaint is the alleged unjust freight discrimination and the effort to bring the West in competition.

The population of New York City is officially declared to number 1,513,501. While the returns from the business district show a decrease during the decade, the so called metropolitan district, where residences are located, shows a tremendous advance, there being at present not far from 3,000,000, if all adjacent places affected by this extension are included.

An Ottawa dispatch says the new tariff in the United States, if carried into effect, will practically close that market against $14,000,000 worth of products exported to that value annually from Canada to the United States during the past few years. This is equal to 33¼ per cent. of the total yearly exports from Canada to the American market.

Philadelphia's foreign trade is gaining. The total imports for the eight months just ended are $39,437,321, against $36,648,392 for a corresponding period last year, showing an increase of $2,788,929.

Work on the new municipal buildings in Center street and many other large jobs has been stopped by the scarcity of brick, while the manufacturers are perfecting their tie-up in opposition to the boycott at the yards in Verplanck Point. A number of dealers have informed their customers that no more brick can be supplied. As many men in various trades are being thrown out of work a crisis of some kind is believed to be not far off.

MANUFACTURING.

Iron and Steel.

Chamberlain, Wheeler & Co., of Columbus, Ohio, have been appointed sales agents for the sale of the product of the furnace of the Fort Payne Furnace Company, of Fort Payne, Ala., It has a capacity of from 75 to 100 tons per day, and will make a specialty of foundry iron. They manufacture their coke from Alabama coals and are so located that they will make their iron from a mixture of 75 per cent. brown hematite and 25 per cent. of limestone fossiliferous ores.

The Scottdale Iron and Steel Company, Limited, of Scottdale, Pa., are now busy opening up their coal mines and making the necessary changes about their plant preparatory to returning to the use of coal. This has been made necessary by the fact that the South West Natural Gas Company, who supplied the firm with gas, have notified all manufacturers that the supply of gas at the wells at Grapeville, Pa., is failing, and that all contracts will be canceled on October 1 next.

The annual meeting of the stockholders of the La Belle Iron Works, of Wheeling, W. Va., was held on Tuesday, the 9th inst. The following directors were elected: John Wright, A. J. Clarke, W. T. Burt, Harry L. Doty, John J. Jacob, W. R. E. Elliott and C. A. Robinson. The entire plant of this company, consisting of rolling mill and nail factory, is in full operation.

Hamilton Furnace, of Means, Kyle & Co., at Hanging Rock, Ohio, which has been undergoing repairs for some time, resumed operations during the present week.

The Rome Cotton Ties Mfg. Company have been incorporated at Rome, Ga., with $50,000 capital stock, for the purpose of operating a rolling mill and manufacturing cotton ties. This company have purchased for $38,500 the Rome rolling mill, and will considerably enlarge the plant and add improved machinery. The incorporators of the new company are B. A. Jenkins, of Knoxville, Tenn., J. J. Reed, D. R. Beyon, and others.

The blast furnace of the Riverside Iron Works, at Steubenville, Ohio, which has been undergoing repairs for some time, resumed operations during the present week. The improvements made were very extensive, and the furnace is practically a new one. The output of the furnace is expected to show a good increase.

Furnace A, of Carnegie Brothers & Co. (Limited), at Braddock. Pa., which has been undergoing repairs for some time, resumed blast on Thursday, September 11. This stack is operated on spiegel exclusively, and produces about 850 tons per week.

D. R. Lean, engineer and contractor, Penn Building, Pittsburgh, Pa., has contracted with William M. Kaufman & Co., of Sheridan, Lebanon County, Pa., for a plant of two Ford & Moncur fire brick hot blast stoves 20 feet in diameter by 60 feet high, with an iron draft stack 7 feet in diameter by 130 feet high.

The new blast furnaces in course of erection at South Chicago, Ill., are making satisfactory progress. The Illinois Steel Company expect to have two of their new stacks in operation in October, and the other two will probably be completed and put in blast by January. The Iroquois Furnace Company's blast furnace is under construction and considerable work has already been done, but it will not be completed much before the spring of 1891.

The Fort Payne Furnace, No. 1, at Fort Payne, Ala., went into blast on Monday, the 8th inst. The fire was lighted at 9 a.m. and the blast turned on at 3 p.m. The gas was fired in boilers and stoves, without the slightest explosion. At 6 a.m. Tuesday she made a first flush of good cinder and on Wednesday at 5 a.m., the first cast, 8 tons of gray forge. J. H. Mullin, the superintendant, reports that it is now running nicely on No. 3 foundry, not having made a pound of white or mottled iron. The furnace is now running on a mixture of 50 per cent. brown ore, 25 per cent. red hematite and 25 per cent. soft hematite.

The annual meeting of the stockholders of the Thomas Iron Company was held at Hokendauqua on Tuesday. The annual report congratulated the stockholders on the satisfactory result of the year's business. All the furnaces were in average blast 48 weeks, and the average production was 336 17-120 tons per week per furnace, the total product being 175,170 16-20 tons, an increase of 19,505 tons as compared with the previous year, and the largest output in the history of the company. The deliveries of iron were 183,153 tons, against 143,166 in the preceding year. The net income from all sources was $420,065, or about 21 per cent. on the capital stock of $2,000,000, or $2.29 per ton profit on the pig iron produced. The surplus carried forward was $160,944, making the total

surplus $1,782,591. The 7 per cent. bonds due July 1 have been retired, and new 5 per cent. bonds issued to the amount of $300,000. Besides the regular cash dividend, a 25 per cent. dividend in scrip was distributed during the year. The following Board of Directors were elected: Samuel Thomas, B. G. Clark, J. T. Knight, Daniel Runkle, Samuel Drake, Charles Stewart and W. W. Marsh. Mr. Clark was re-elected president and Mr. Knight secretary and treasur

The 16 inch bar mill at the Gautier department of the Cambria Iron Works, Johnstown, Pa., has been put in successful operation.

The Apollo Iron and Steel Company, Apollo, Pa., have just completed the erection of a new sheet mill as an addition to their plant, and have broken ground for three more sheet mills and a plate mill. A tin plate mill is also contemplated.

The Muskegon Iron and Steel Company, Muskegon, Mich., will start up in about two weeks.

The Nova Scotia Steel Works, New Glasgow, N. S., have been approached by an English syndicate, who offer $400,000 cash and $200,000 stock for the plant. If the purchase is made, it is probable that the steel works will be amalgamated with the New Glasgow Coal and Iron Company.

It is said that contracts have been signed for the erection of a rolling mill, iron furnace, foundry and machine shops at Kensington, Ga.

The work of relining the furnace of the Burden Iron Works, Troy, N. Y., will commence this week, and a Gordon-Whitwell hot blast oven added. The capacity of the furnace will be increased by the alterations.

The Diamond Iron Mining and Mfg. Company, with a capital of $1,000,000, have been chartered at Negaunee, Mich.

The repairs on the Pulaski Furnace, at Pulaski, Va., will be completed and the furnace blown in about October 20.

The Ætna Iron and Steel Company, Bridgeport, Ohio, have called a meeting to consider a proposition to increase the stock of the company to $500,000.

The Ellis & Lessig Steel and Iron Company, of Pottstown, Pa., have commenced the erection of a new building to enlarge their puddling department. Two more furnaces will be added to the mill, making 22 in all.

The Cambridge, Ohio, Iron and Steel Company have recently equipped a machine shop for the purpose of doing their own repair work, and have also placed a contract for two 10-ton cranes.

The California Iron and Steel Company have mortgaged to J. L. N. Shepard property in Alameda, Nevada and Placer counties, to secure the payment of a debt of $100,000. The works of the compay at Emeryville are offered for sale.

The city of Wabash, Ind., has raised a subsidy of $30,000 to secure the location of a steel rolling mill.

J. D. Dwyer, superintendent of the Birmingham Rolling Mill Company, of Birmingham, Ala., was a visitor in Pittsburgh last week. Mr. Dwyer was there for the purpose of getting employees for their plant. A number of men, formerly employed by the Carbon Iron Company, of Pittsburgh, were engaged by Mr. Dwyer and left for Birmingham during the present week.

Seaman, Sleeth & Black, proprietors of the Phœnix Roll Works, at Pittsburgh, have voluntarily reduced the hours of their workmen from ten to nine, without any reduction in wages.

At a recent meeting of the directors of the newly organized Ashland Steel Company, of Ashland, Ky., the following officers were elected: Ironton A. Kelly, president; John Russell, vice-president; E. C. Means, treasurer, and B. H. Burr, secretary. At the meeting the $100,000 donated by the citizens of Ashland for the purpose of securing the plant was turned over to the new company, who have also been granted a free site and relief from municipal taxes for ten years.

The malleable iron works of Sweet & Clarke, at Marion, Ind., were recently damaged $2000 by fire.

Articles of incorporation of the Durango Steel and Iron Company have been filed at Des Moines, Iowa. The capital stock is fixed at $5,000,000, and the principal places of business are Des Moines and Durango, Mexico.

The plant of the Falls City Malleable Iron and Steel Works, Louisville, Ind., was recently destroyed by fire. The loss was fully covered by insuranae.

Machinery.

The Carroll-Porter Boiler and Tank Company, of Pittsburgh, have received the order for a majority of the wrought iron work, including cast house, &c., for the Iroquois Furnace, to be built near Chicago by Pittsburgh and Youngstown capitalists. The same firm have also received a contract for a large amount of caisson work for a railroad bridge over the Pedee River, in South Carolina. The bridge will be built in cylinder piers, four of which are 6 feet, two 10 feet and one 17 feet in diameter. The piers in the center of the river will be about 50 feet high. The Carroll-Porter Boiler and Tank Company will construct these seven piers.

H. K. Porter & Co., Limited, of Pittsburgh, light locomotive builders, have received orders for a number of locomotives to be used on railroads projected to connect the silver mines in the states of Sonora, Durango and Chihuahua, Mex.

The offices of the Westinghouse Air Brake Company, formerly located on Robinson street, Allegheny, Pa., have been removed to Wilmerding, Pa., where the new plant of the firm is located. All the machinery has been removed from the old works in Allegheny to that place. The general offices will be located temporarily in the new club house until the general office building is completed. The main office for transferring and performing other business will be located in the Westinghouse Building, in Pittsburgh. It is announced that the Standard Underground Cable Company, whose works are now located in Pittsburgh, will erect buildings and remove their plant to Wilmerding during the early part of next year. The shops in Allegheny, vacated by the Westinghouse Air Brake Company will be occupied by the Fuel, Gas and Electric Mfg. Company.

A successful test of a new noiseless motor, invented by George Westinghouse, Jr., was tested in Pittsburgh last week in a car of the Pleasant Valley Electric Railway. As is well known, the noise of a car in motion is made by the rapid rotation of the gear wheels of the motor. The idea of the Westinghouse patent is to leave the wheels inclosed in an air-tight box with the gear wheels immersed in lubricating oil. The test proved that the idea was a good one so far as deadening the noise was concerned. The car made but very little noise while in motion.

Armstrong Bros., boiler manufacturers, of Springfield, Ohio, have just placed in their works a set of 12 foot boiler rolls and a No. 2 Hilles & Jones punch; also a 60 inch swing by 24 inch engine lathe and radial drill press.

The Salem Car and Machine Company have just been organized at Salem, Va., by capitalists from New York, Boston, Maine and New Hampshire. The authorized capital is $500,000. Work on the new plant will commence as soon as the formation details are completed. J. W. Allemong is president and W. U. B. Stinson of Concord, N. H., is vice-president.

The Westinghouse Machine Company, of Pittsburgh, Pa., advise us that their sales for August amounted to 87 engines with a combined horse-power of 4640. Among the orders received were the following: One 150 horse-power and one 100 horse-power Compound for Weeling Electric Light Company, Wheeling, W. Va.; two 100 horse-power Compound for Terre Haute Street Railway Company, Terre Haute, Ind.; one 125 horse-power Compound for Newport News Shipbuilding and Dry Dock Company, Newport News, Va.; one 100 horse-power Compound for Galveston Street Railway Company, Galveston, Texas; one 80 horse-power Compound for Media Electric Light Company, Media, Pa.; one 75 horse-power Standard for Rochester Electric Light Company, Rochester, Pa.; one 75 horse-power and one 35 horse-power Junior for Lord Lumber Company, Oscado, Mich.; one 50 horse-power and one 15 horse-power Junior for City Improvement Company, West Superior, Wis.; one 80 horse-power Compound and one 15 horse-power for France; one 100 horse-power Standard for Russia; one 5 horse-power Junior for British Guiana.

The Dwight Mfg. Company, of Chicopee, Mass., have contracted to enlarge their works by the addition of a machine shop 210 feet in length, with new iron working tools.

The new plant of the Lake Erie Engineering Company, at Buffalo, will be one of the finest of the kind in the country. The machine shop will be 108 feet wide by 185 feet long, and the foundry buildings will be of the same width, but 225 feet in length. The buildings will be of iron and designed by Felkel, civil engineer and architect, of Cleveland, Ohio, and will be built by the Berlin Iron Bridge Company, of East Berlin, Conn. It is expected that the buildings will be completed and ready for occupancy by January 1, which is a very short time, considering the magnitude of the undertaking.

The Nicholson & Waterman Mfg. Company, of Providence, R. I., have just issued a book which is divided into two parts. Part 1 treats of boring and describes the boring machine built by them, while part 2 illustrates a few of the many operations which can be advantageously done by this machine.

The portable chain hoists made by J. G. Speidel, of Reading, Pa., are very simple in construction, are quick acting and possess great strength and durability. The hoist is well liked by those who have used it, and is meeting with great success.

Among the sales of the past month of the steam damper regulator made by the Mason Regulator Company, Boston, Mass., were the following: Three to F. S. Sturtevant, for his system of steam heating; one each to the following: Harrison Woolen Mills, Worcester; Fitchburg Machine Company and Rice Shirt Company, Fitchburg; Leominster Worsted Mills, Massachusetts; Hew's Pottery Works, Chelsea; Boston Y. M. C. A. Building, Pennsylvania Railroad for the new Altoona shops, New York *World* Building.

The Waltham Watch Tool Company have just completed and equipped a new and larger factory in Springfield, Mass. In addition to their regular line of goods, consisting of the well known Hopkins lathes, attachments, &c., they are now prepared to manufacture fine tools and machinery of all kinds, models, dies, &c.

The International Boiler Company, formerly of New York City, have been reorganized with a capital stock of $500,000, and the following officers have been elected: O. C. Barber, of the Barber Match Company, of Akron, Ohio, president; Allan Stirling, secretary and treasurer, and Thomas Deegan, of James P. Witherow, of Pittsburgh, general manager. The new company have received about 100 acres of land at New Portage, Ohio, on which they will erect a new plant for the manufacture of the Stirling boiler. The boiler shop proper is now under way, the building being 80 feet wide by 250 feet long. It will be equipped with tools of special design, which are now being manufactured by the William Sellers Company, Incorporated, of Philadelphia and the Niles Tool Works, of Hamilton, Ohio. When in full operation the plant will have a capacity of 400 horse-power of boilers per day. Agencies for the sale of the product of the firm will be established in all the principal cities. The company have already received numerous large orders for boilers, which are being filled at the works of James P. Witherow, at New Castle, Pa. We are authorized to state that the report that Thomas Deegan would sever his connection with J. P. Witherow, of Pittsburgh, is without foundation.

The Standard Underground Cable Company, of Pittsburgh, have declared a dividend of 1½ per cent. out of the earnings of the quarter ending on August 30 last.

The boiler works of Rarig & Nichols, at Columbus, Ohio, will be removed to Buena Vista, Va.

The St. Joseph Bridge and Boiler Works, a new industry at St. Joseph, Mo, have commenced operations.

The Muskegon Machine and Foundry Company have been incorporated at Muskegon, Mich.

Hardware.

E. T. Barnum, Detroit, Mich., manufacturer of ornamental wire work, advises us that he has secured the contract for the wire and iron work for the annex to the Post Office at Detroit, being the lowest bidder.

It is rumored that the Cincinnati Wire Company are negotiating for a site near Chicago. They have several locations offered from which to make a selection. The new industrial town of Harvey, in Illinois, hope to get them, but Hammond, in Indiana, is a formidable competitor.

The Kanawha Bicycle Company have been incorporated at Charleston, W. Va, with a capital stock of $50,000 to manufacture bicycles, tricycles, velocipedes, &c. The officers of the company are as follows: Jacob Jelenco, president; Frank Woodman, vice-president; W. T. McClurg, secretary, and Moses Frankenberger, treasurer. A. J. Gould, who organized the company, was made manager, is making some special machinery, and it is expected that the works will be in operation not later than November 1 next.

We are advised by the Kentucky Wagon Mfg. Company, Louisville, Ky., that against competition from all the prominent manufacturers of the United States they have secured the contract for building 110 extra large army wagons for the United States Quartermaster's Department, They also report that the demand for Old Hickory wagons continues very good from all sections.

The Sterling Emery Wheel Company, 174 Fulton street, New York, with factory at West Sterling, Mass., advise us that owing to the rapid increase of their emery wheel business, and want of room at their present factory,

they will move from West Sterling, Mass., to Tiffin, Ohio, where a much larger building, measuring 200 x 60 feet, is ready for their occupancy. The new location will be more central, and nearer to some of their most important customers, and will give them ample transportation facilities, as three railroads pass through Tiffin. As their process is one in which much fuel is consumed, the importance of natural gas is very great, and gas will hereafter be used instead of coal. The earthenware business will be carried on at West Sterling as before.

Miscellaneous.

The Manufacturing Investment Company, of New York, have placed the contract for their new mill at Madison, Me., with the Berlin Iron Bridge Company, of East Berlin, Conn. The buildings will be of iron from the designs of the Berlin Company, and will consist of digester building, 62 feet wide by 220 feet long, and four stories high; the machine shop, 72 feet wide by 172 feet long, and the washing room, 74 feet wide by 182 feet long, two stories high. The works will be the largest of the kind in this country, and will be located at Madison. Me., in the heart of the wood pulp district.

The officers of the Walter A. Wood Mowing and Reaping Machine Company, of Troy, N. Y., recently visited Milwaukee to arrange for the erection at that point of a Western plant. They stated that about $1,000,000 would be invested, and that 1000 men would be employed. The people of Milwaukee, through the Milwaukee Advancement Association, have guaranteed to provide a site.

The following is a list of some new Illinois corporations of interest to our readers: Artesian Mfg. Company; location, Chicago; to manufacture the Artesian coffee pot and other specialties; capital stock, $100,000; incorporators, D. L. Mulford, Charles Doran and Emma Noel. The Collapsible Railway Car Company; location, Chicago; to manufacture and sell collapsible railway cars and improvements thereon; capital stock, $100,000; incorporators, Louis C. Zolk, Henry F. Sanders and John T. Richards. Eucalyptus Boiler Compound Company; location, Chicago; the manufacture and sale of compound to prevent the incrustation of boilers; capital stock, $500,000; incorporators, Sidney A. Stevens, Davis R. Boogher and Mahlan S. Frost. Northwestern Equipment Company; location, Chicago; the manufacture of railway supplies, the construction of railways and the negotiation of car trusts; capital stock, $500,000; incorporators, Mahlan S. Frost, Sidney A. Stevens and Edward I. Frost. Thwing Electric Company; location, Chicago; to manufacture and deal in lamps and general supplies; capital stock, $500,000; incorporators, Wilber J. Andrews, Charles E. Piper and Charles B. Thwing. Whiteside & Fuller Electric Mfg. Company, at Chicago; to manufacture electrical machinery and appliances; capital stock, $100,000; incorporators, W. H. Whiteside, W. H. Pettibone, W. D. Carlile. Illinois Iron and Metal Company; location, Chicago; to buy and sell scrap iron and other metals; capital stock, $2000; incorporators, Hyman Lewinsky, Simon Kurlewich and A. Wolf. Hardware Mfg. Company, Chicago; to manufacture and sell hardware novelties; capital stock, $10,000; incorporators, Charles E. Gorton, Harry Harrison and others. The Elrick Steam-Binder Company; location, Joliet; to manufacture harvesting machines and agricultural implements and machinery; capital stock, $5000; incorporators, Edward Etheridge, Nathan Bennett and James F. Barnes. Cleveland Leather and Belting Company; location, Chicago; to manufacture and deal in leather, raw hides and articles made therefrom; capital stock, $300,000; incorporators, A. C. Krueger, E. L. Shepard and W. Rossiter.

The new casting shop of the Midvale Steel Company will be designed and built by the Berlin Iron Bridge Company, of East Berlin, Conn.

The Bonzano Metallic Railroad Tie Company have been chartered in New Jersey, with a capital of $1,000,000, to manufacture steel railroad ties under the patents of M. F. Bonzano, assistant general superintendent of the Philadelphia and Reading Railroad.

A Milwaukee special says Wood Harvester Company, of Troy, contemplate establishing a branch factory in that city, following the action of the Fuller & Warren Stove Company, with whom they are closely allied.

Pratt & Whitney, of Hartford, are about to put on the market an automatic grain scale. One of these scales has been running for many months at the Jewitt mills, in Brooklyn.

The Greensburg Fuel Company, of Greensburg, Pa., recently announced that they would raise their rates on October 1 next. On account of this a new company has been formed, with J. W. Moore, the well known coke operator, as president. It is said that the new company will issue stock to the amount of $100,000, and that five and ten year contracts will be made at the rates the old company have been charging. At Latrobe, Pa., the citizens are making arrangements to go back to coal, having received a final answer from the Cambria National Gas Company that they would not lower rates. The rates at Jeanette, Pa., have also been raised about 50 per cent.

The new 100 oven battery of the De Bardeleben Coal and Iron Company has been fired, making 420 ovens in blast at furnaces 1 and 2 and 300 at furnaces 3 and 4. The ovens yield a daily product of over 1000 tons of coke, 625 tons of which are consumed by the four furnaces in blast.

We have received from the Connecticut Motor Company, of Plantsville, Conn., a well illustrated catalogue describing their electric motors, power generators and incandescent dynamos. In addition to describing the machines built by them, the catalogue contains much valuable information in regard to electric lighting, traction and power.

The Jones Safety Nut Lock Company, of Syracuse, N. Y., contemplate moving their plant to South Chicago, Ill.

The Eureka Car Coupler Company, capital stock, $250,000, have filed articles of incorporation at Waterloo, Iowa.

The Superior Horse Nail Company have broken ground at Kankakee, Ill., for a new factory.

PERSONALS.

Ralph Greenlee, of Greenlee Bros., Chicago, manufacturers of woodworking machinery, started for Japan with his family about the middle of July last. His brother, Robert, received a cablegram frrm him last week announcing his safe arrival on the other side of the Pacific after a very pleasant voyage. He expects to be absent about two years, and will visit the principal points of interest in foreign countries, passing over very nearly the same route that was taken by Hon. Carter H. Harrison, ex-Mayor of Chicago, on his tour around the world.

Sir William Arrol, of Glasgow, and Sir Benjamin Baker arrived during the week.

N. Eckstein, of Leipsig, and A. W. Schneider, of Mitten, members of the Verein Deutscher Eisenhuettenleute, have arrived.

E. T. Clymer, of the Allentown Iron Company, has accepted the superintendency of the Radford Crane Iron Company, at Radford, Va. He will go to Radford during the coming winter.

VIRGINIA IRON NOTES.

An iron furnace is wanted at Gladstone. In that vicinity there has been known to exist, for over a quarter of a century, deposits of iron ore. For more than 20 years some of these mines have been worked, and are still in operation, shipping ore to furnaces at a distance. E. A. Oldham, of Norfolk, Va., can give further particulars regarding this property.

A number of remarbably fortunate invest ments in wild land have in recent years been made in Virginia, an instance in point being the purchase not long ago, by Huddleston Bros., of Greenbrier County, W. Va., of a tract of 900 acres on Pott's Creek, along the slope of Peter's Mountain, near the town of Covington. The land was purchased at a small price, with the intention of holding for a rise in values; in the meantime the new owners, being of an investigating turn of mind, began making researches of mineral deposits. Their efforts have been rewarded with success, and a vein of iron ore was recently discovered which, upon analysis, is shown to contain 58 per cent. of metallic iron. The Messrs. Huddleston have recently organized a company in order to develop their property, and a blast furnace and rolling mill are to be established near the town of Covington. The vein of ore already opened has been drilled to a depth of 30 feet, with no appreciable indications of weakening.

At Luray, the Luray Foundry and Plow Works Company were recently organized, with a capital stock of $25,000. A general manufacture of agricultural implements will be engaged in. S. G. Gilmer is president; H. V. Hudson, secretary; S. P. Brubaker, superintendent.

The charter of the Virginia Furnace Company, at Roanoke, has recently been amended, so as to increase the capital stock from $1000 to $20,000 additional. J. B. Levy is president of this company. Their West End furnace is preparing to go into blast, and Henry King, of Pittsburgh, will have charge of it. He will also superintend the construction of the rolling mill to be erected by this company.

The combined capacity of the two iron furnaces now being constructed at Big Stone Gap, by Byrd & Peters, will be 1400 tons per week. The work of their construction is being pushed with all possible speed.

A company has also been organized at Buena Vista to build and operate the boiler and engine works reported in this correspondence last week. The officers elected are: A. K. Rarig, president; A. T. Barclay, vice-president; J. H. Millen, secretary.

The Humbert Nut Lock Company have been organized at Staunton, instead of Basic City, as currently reported. The company have a capital stock of $10,000. T. S. Doyle, of Staunton, is treasurer; J. S. Christian, of Roanoke, vice-president; Taylor Bissell, of Staunton, secretary.

The Stanley Land and Furnace Company have been organized at Stanley, and the following officers elected: James Macnider, of New York, is president; T. J. McSpeiden, of Baltimore, Md., vice-president; L. T. Hyde, of New York, secretary.

It is reported at Luray that Northern parties intend establishing a $400,000 hardware factory in that place.

It is stated that at Goshen the Woodcock Iron Works, of Auburn, N. Y., are to be moved to that place, and that this enterprise will be followed by the removal of a pipe works from Syracuse, N. Y. It is further stated that the Keystone Machine Company, of Williamsport, Pa., intend moving their machine works to Goshen.

The charter of the new Lynchburg Iron Company, at Lynchburg, provides that the capital stock of the company be not less than $110,000, nor more than $200,000. The president of this company is E. Burd Grubb, of New Jersey.

The Development Company, at Luray, are negotiating for the establishment of a boiler and engine works at that place.

The Graham Furnace Company expect to have their furnace in blast by November 1; its dimensions are 10 x 70 feet, and it is to have a capacity of 100 tons per day. This company have a capital stock of $250,000.

The furnace of the Columbia and Liberty Iron Company, Columbia Furnace, Shenandoah County, is to be rebuilt.

The Big Stone Gap Land and Improvement Company are negotiating for the establishment of a nail works at Big Stone Gap.

At Goshen it is reported that the Keystone Machine Company, of Williamsport, Pa., contemplate the removal of their machine works to Goshen.

At Richmond the Virginia Steel, Iron and Slate Company have been incorporated for the purpose of mining and manufacturing any of the ores, minerals, metals, materials or products of Virginia and to conduct business in one or more points in the counties of Albemarle, Nelson, Buckingham and Fluvanna Counties. The capital stock is to be not less than $100,000 nor more than $2,000,000, and real estate may be held not exceeding 100,000 acres. The main office will be in Richmond. The following are the officers elected for the first year: President, F. T. Anderson; vice-president, H. W. Flournoy; secretary, J. G. Hankins; treasurer, J. E Gaines; directors, Messrs. Anderson, Flournoy, J. J. Hichok, Alexander Cameron and S. Blanchard, of Richmond, and T. P. Williams, of King's Mountain, N. C.

The Hampton Iron Company, of Hampton, have been awarded a contract to build a $16,000 iron bridge over the Hampton River.

It is stated a $500,000 company have about perfected their organization at Mineral City, to establish reduction works in that town, working the ore from the Walton mine.

C. L. Wilson and others are interested in the establishment at Buchanan of machine works for the manufacture of roller process flour mill equipments.

It is stated that the Pike Mfg. Company, of Boston, Mass., are thinking of moving their plumbing plant to Waynesboro.

W. H. Young is president of a company recently organized at Mineral City to establish tin works.

The Iron Age

New York, Thursday, September 18, 1890.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, JR. - EDITOR.
GEO. W. COPE. - - ASSOCIATE EDITOR, CHICAGO
RICHARD R. WILLIAMS - - HARDWARE EDITOR.
JOHN S. KING. - - - - BUSINESS MANAGER.

The Money Stringency.

The business community has been deeply agitated during the past week by a recurrence of the stringency in money, of which the happenings in Wall street furnish only an indication. The high rates on call loans, while they affect directly only a small class, do indirectly, under the peculiar conditions existing, tell sharply on the position of business men throughout the country. The banks accord their customers accommodations only reluctantly, and those who must go to others for help have been charged high rates, in addition to commissions. It is reported that there have been many such transactions, the details of which, of course, do not reach the general public. It is only natural that speculators in Wall street have taken advantage of the situation for their own selfish ends. They have industriously worked for a scare, to shake out weak holdings of stocks and bonds on the one hand and to frighten the Treasury Department into purchasing certain issues of Government bonds at a very heavy premium. The importing interests and the financial institutions back of them have urged upon the Secretary of the Treasury and have succeeded in securing his co-operation in the demand that the period during which goods in bond on October 1 may be withdrawn be extended, in the pending Tariff bill, from November 1 to February 1, 1891. The money needed to pay the duties will be distributed over a longer period, which will give the importers a chance to take orders for their wares from their customers before paying the duties. This question affects directly only such trades in which material changes have been made in the forthcoming Tariff bill; the dry goods, tobacco and other trades being particularly interested. Down to the smallest dealer, the men in those trades have bought as much as they could borrow money to pay for. A good many have exhausted their credit in doing it, and have not got the funds to pay the duties. If they are forced to sell, the market in those lines will be badly demoralized and the whole trades will suffer, including the home manufacturers of like or similar goods. In the iron trade this feature of the situation cuts no figure whatever. There have been no important advances in crude iron or partially manufactured heavy goods, except in cotton ties, in which the season's sales are practically over. What transactions there have been in billets and wire rods have been made at buyers' risk of duty. In the metal trade the change in the tin plate duty does not go into effect for a long time to come, while in the hardware branch only relatively limited lines of articles are affected.

Directly, therefore, the agitation for delay does not influence the iron trade much, although indirectly it may be of serious consequence as one of the factors which may render the money stringency more acute.

The influences which have produced the scarcity of money are numerous and complex. Their effect has to some extent been artificially aggravated, but while they conspire to one end, we cannot discern one so grave in its character as to cause fear of widespread disaster. On the whole there has been little speculation, relatively speaking, in Wall street for a considerable period, and for that reason there has been a tendency to believe that speculative activity was dormant As a matter of fact it has been quite active, although not in its former usual channels of railroad stocks and bonds. There has been considerable speculation in silver, which has locked up some money. There has been a good deal more in cereals, and far more in Southern lands and industrial enterprises. The Northern Pacific Coast has had quite a period of speculative activity. But singly none of these movements have engaged funds to such an extent as to cause widespread disaster. On the contrary, the usual drain to move crops in the West and in the South has come earlier, and has been more heavy because the aggregate sum of money which it proposes to put into the pockets of our agricultural population is much larger than usual. Our great staple productive industries, and particularly the iron trade, are in an exceptionally sound and prosperous condition. Prices are not inflated, but they yield a satisfactory profit to all but poorly located or badly managed concerns. They are low enough to induce a consumption unparalleled in the history of the iron trade with the exception of years of a craze for railroad building. For that very reason the business is on a sounder basis than it ever was.

A scare or a panic created by influences foreign to the iron trade would, however, affect it adversely. It would lead to a sharp contraction in the volume of business and to softening of the markets. So far as it lies within its power, the Treasury Department has made every effort to relieve the strain. Every day thus gained counts for a good deal, since it helps the business men to adjust their affairs to prevailing conditions. A panic is possible only when the majority of traders and producers in the country are caught unawares. They have been amply warned by the happenings of the past month.

The worst feature of the situation to the majority of business men in lines not directly affected is the fact that every one, in anticipation of trouble, is making effort to gather in all his available funds, and at the same time is paying out only what he cannot help settling for. Even those who do not need the pretext of tight money, to keep their creditors waiting, are delaying payment whenever they can. As soon as the scare is over business men will quickly abandon this policy.

Are We Governed Too Much?

The discussion of purely political questions is outside the province of a trade paper. Occasionally, however, a political subject comes before the people which is so closely associated with their business interests that it is eminently worthy of consideration by a business journal. Of such a character is the suggestion which comes from the West that regular legislative sessions are unnecessary and even injurious. The idea thus put forth is sufficiently novel and interesting to attract general attention. The experience in all the States, without exception, has been that annual legislative sessions merely offered an opportunity for the enactment of laws designed to establish a reputation for ambitious members, or to promote their individual interests in some other way. The statutes of every State were thus so loaded down with special laws of an unnecessary and even injurious character that biennial sessions have now become the rule, through amendments to State constitutions adopted by the people to correct an increasing evil. But even the biennial sessions have been found to offer too much opportunity for faulty legislation, and the reform now proposed is to have the legislature assemble only in case of public emergency and at the call of the Governor of the State.

There are strong arguments in favor of emergency sessions as against regular sessions, which will at once suggest themselves to men of affairs. Our cherished institution of government by the people has degenerated in too many instances into the oppression of business interests by those invested with temporary power as members of the Legislature. It is not too much to say that in our leading States the opening of a legislative session begins a period of anxiety to those conducting great business enterprises, which only terminates when the announcement is made that the Legislature has adjourned *sine die*. We do not refer to business enterprises of a shady or barely legitimate character, or to those which need wholesome restraint, as they can usually take care of themselves in spite of hostile legislation. We refer to interests of a strictly honorable nature, managed in a straightforward way for the benefit of those who have invested their capital in them. Every promise made to the public may be carried out to the letter, and full value may be given for every dollar of income received, but if the enterprise, of whatever character it may be, is fairly profitable it is a shining mark for some ambitious demagogue to aim at. The adverse legislation, whether it be the imposition of heavy taxes, the enactment of unnecessarily onerous regulations or the restrictions of perogatives, is always undertaken in the name of the people of the State and for their benefit. Corporations giving em-

ployment to large numbers of people have been actually driven out of a State by reckless legislation of this character, thus inflicting injury to the community instead of benefit.

The only function of a legislature which calls for regular attention is the appropriations for the State Government and public institutions, but as these are now made at biennial sessions for a year or two ahead, they could easily be made for a still longer period and the public service would not suffer.

The strongest objection to the holding of emergency sessions only is the power which would thus be placed in the hands of the Governor of a State. He might not recognize any emergency whatever as of sufficient importance to warrant the calling together of the Legislature, and as the Legislature usually possesses the sole power of impeachment he could serve out an entire term with no fear of being called to account for a perversion of his functions, should he wander from the path of official rectitude. That, however, could be easily guarded against in a constitutional proviso.

We fancy that among our readers there are many who would not seriously object to the extension of this new idea in legislation to Congress itself. There are vast business interests which are always unfavorably affected while Congress is in session, and which can only be managed with strict regard to natural conditions after Congress has adjourned. Emergency sessions of that body could probably attend to all needful public legislation. There would then be little chance to make laws which the public has not asked for and less chance to deliver long speeches which the public does not care to read.

The Tin Plate Situation.

The McKinley Tariff bill, which has passed the Senate and is now before the House of Representatives, directs that there shall be levied and collected on and after July 1, 1891, a duty of $2\frac{3}{10}$ cents per pound upon tin plates, terne plates and taggers' tin, with the proviso that on and after October 1, 1896, the respective commodities shall be admitted free of duty, unless it shall be made to appear to the satisfaction of the President that the aggregate quantity of such plates lighter than 63 pounds per 100 square feet produced in the United States during any of the five years preceding June 30, 1896, shall have equaled one-third the amount of such plates imported and entered for consumption during any fiscal year after the passage of the act and prior to the date mentioned. It is also directed that on and after January 1, 1892, there shall be imposed and paid upon cassiterites, or black oxide of tin, and upon bar block and pig tin, a duty of 4 cents per pound.

The ostensible reason for increasing the duty on tin plate $1\frac{2}{10}$ cents per pound is to foster the manufacture of the goods in this country. The imposition of a duty of 4 cents per pound upon pig tin is intended to develop the production of the metal here. In what degree the object in view will be realized is problematical, and opinions are by no means uniform. The placing of 4 cents per pound duty upon pig tin, with no provision for remitting the same in the event of the objects of the act not being realized, as in the instance of tin plate, complicates the situation more or less and leaves with the opponents of the policy of the Administration a basis for predicting entire failure of the scheme. Unless the American output of pig tin shall have been developed to an equivalent of at lease the extent of present consumption, say about 1200 tons per month, the heavy duty upon the foreign metal, it is argued, is likely to stand in the way of the development of tin plate manufacture in this country after the year 1892. It is also suggested that an arbitrary increase of 4 cents per pound in the cost of pig tin, that will go into effect in the year 1892, should the bill be passed in its present form, may have a restraining influence upon the consumption of pig tin for other uses than in the manufacture of tin plate, unless the production of the metal in this country reaches sufficient proportions to cut a conspicuous figure in the world's supply.

Briefly, the propositions of the McKinley bill open up no little speculation as to the future of both the tin plate and the pig tin markets, and shroud the trade in the respective commodities in a great deal of uncertainty. When the proposed increase in the duty on tin plate first got beyond the merely initiatory stage, more or less extensive purchases were made by large consumers and dealers. British manufacturers raised their prices as a matter of course, expecting, as they did, an enormous demand for plates for delivery prior to the date fixed for the increased duty to go into effect. Bessemer steel coke finish plates, for example, moved steadily upward, until an advance of 35 cents per box was scored, and other varieties went correspondingly high. Had it not been for the stringency in the money market and consequent check upon purely speculative purchases, prices would probably have gone still higher. As it is, the passage of the McKinley bill by the Senate has been followed by a reaction, instead of a further advance in values, owing to anxiety of speculative holders to realize. Some so-called "outside" lots have been sold at fully 25 cents per box below regular dealers' prices, under the pressure of tight money. In the present complicated state of affairs it is difficult to gauge the full effect of the proposed increased duty up to this date. Dealers appear committed to a more conservative policy than was manifested a few years ago, however, and large consumers are doubtless more careful in their operations for the time being, and as far as speculation is concerned the tendency seems to be chiefly in the direction of realizing profits. The future is more than usually uncertain. Whether British plate makers will be more anxious to sell than American buyers to stock up prior to the date fixed for the increased duty to go into effect is problematical, and upon that depends the future pendulation of values in a great measure.

At the present time there are about 323,000 boxes of tin plate in store at British shipping ports, or within 45,000 boxes of the quantity held there a year ago, and production is going ahead on a large scale. Out of a total of 480 mills 459 are in oparation, leaving it very probable that future output will be heavy, unless some unforeseen circumstance arises that may put a check upon operations.

The Bureau of Statistics returns the importations of tin plates during the seven months ending July 31 at 405,445,407 pounds, which total is 56,235,627 pounds below that of the corresponding period last year. The August movement has been heavy, but the importations to date are doubtless nearly or quite 50,000,000 pounds short of those of the first eight months of 1889. In this connection the data of importations at New York during the last two months is of particular interest. In July there were entered 261,574 boxes and in August 226,001 boxes, making a total of 487,575 boxes, against 390,977 boxes during the corresponding period last year. Only 22,000 boxes went into bonded warehouses during the two months. Stocks in bond are now about 59,412 boxes, showing only 12,656 boxes increase since January 1, despite the incentive to speculative buying and holding that has been offered. As to supplies in private stores, no data is at hand, but well informed persons express the belief that merchants are carrying very little, if anything, more than their usual supply.

Extracts from the new uniform freight classification elsewhere given show that the railroad companies have, as usual, taken advantage of the opportunity to advance freight rates. Hardware and tinware are among the articles selected for an advance, which is particularly heavy on the latter. This was not expected when announcement was made that a committee of railroad officials were at last at work on this important matter. It was supposed that rates would be maintained on the basis prevailing under the old classifications. But the temptation to mark up rates was evidently too great to be resisted. The same course was taken when the Interstate Commerce act went into effect and long and short haul charges had to be harmonized. Rates were generally advanced, but they were not maintained at the figures first put forth, as shippers fought them vigorously. The latter will hardly submit tamely to this new attempt to reimpose high rates under color of establishing uniformity.

The first sale of iron lands on Atikokan Range was consummated at Port Arthur on the 12th inst. The property sold consisted of three mining locations, 80 acres each, covering one and one-half miles on the range situated on Atikokan River. The sale was made by Thomas Marks & Co., and the purchaser was W. H. Pattison, of Superior, Wis., one of the owners of the Chandler Mine, on Vermillion Range, and consideration $15,000 cash. It is said that the ore is of Bessemer quality.

THE SENATE BILL.

In *The Iron Age* of June 26, 1890, page 1072, we presented in detail those paragraphs in the metal schedule which differed in their provisions from the House bill. On the whole, the bill presented by the Finance Committee of the Senate has undergone very few modifications during the course of the discussion during the past few months. We present below those paragraphs in which changes were made, bracketing the House rates and placing in italics changes in wording or additions made.

Beams, girders, joists, angles, channels, car truck channels, TT, columns and posts or parts or sections of columns and posts, deck and bulb beams and building forms, together with all other structural shapes of iron or steel, whether plain or punched, or fitted for use, *eight-tenths* (nine-tenths) of one cent per pound.

Boiler (or other plate iron or steel, except saw plates hereinafter provided for), *plates of iron or steel and other plate iron*, not thinner than number ten wire gauge, sheared or unsheared, and skelp iron or steel, sheared or rolled in grooves, valued at two cents per pound or less, *eight-tenths* (one cent) per pound; valued above two cents and not above three cents per pound, *one and one-tenth* (one and two-tenths) cents per pound; valued above three cents and not above four cents per pound, *one and five-tenths* (one and six-tenths) cents per pound; valued above four cents and not above seven cents per pound, two cents per pound; valued above seven cents and not above ten cents per pound, two and eight-tenths cents per pound; valued above ten cents and not above thirteen cents per pound, three and one-half cents per pound; valued above thirteen cents per pound, forty-five per centum ad valorem. *Provided*, that all plate iron or steel thinner than number ten wire gauge shall pay duty as iron or steel sheets.

All iron or steel sheets or plates, and all hoop, band or scroll iron or steel, excepting what are known commercially as tin plates, terne plates and taggers tin, and hereinafter provided for, when galvanized or coated with zinc or spelter, or other metals, or any alloy of those metals, shall pay one-half of one per cent. per pound more duty than the rates imposed by the preceding paragraph upon the corresponding gauges, or forms, of common or black sheet or taggers iron or steel; and on and after July first, eighteen hundred and ninety-one, all iron or steel sheets, or plates, or taggers iron coated with tin or lead or with a mixture of which these metals or either of them is a component part, by the dipping or any other process, and commercially known as tin plates, terne plates and taggers tin, shall pay two and two tenths cents per pound: *Provided, that on and after October first, eighteen hundred and ninety-six, tin plates and terne plates lighter in weight than sixty-three pounds per hundred square feet shall be admitted free of duty, unless it shall be made to appear to the satisfaction of the President (who shall thereupon by proclamation make known the fact) that the aggregate quantity of such plates lighter than sixty-three pounds per hundred square feet produced in the United States during any of the five years preceding June thirtieth, eighteen hundred and ninety-six, has equaled one-third the amount of such plates imported and entered for consumption during any fiscal year after the passage of this act, and prior to said October first, eighteen hundred and ninety-six: Provided, that the amount of such plates manufactured into articles exported, and upon which a drawback shall be paid, shall not be included in ascertaining the amount of such importation: And provided further, that wares tinned in the United States, and manufactured from black sheets of said weight made in the United States shall be considered tin plates produced here within the meaning of this provision.*

All double barreled, sporting, breech loading shot guns valued at not more than six dollars each, *one dollar and fifty cents* (two dollars) each; valued at more than six dollars and not more than twelve dollars each, four dollars each; valued at more than twelve dollars each, six dollars each; and in addition thereto on all the above thirty-five per centum ad valorem. Single barrel breech loading shot guns, one dollar each and thirty-five per centum ad valorem. Revolving pistols valued at not more than one dollar and fifty cents each, forty cents each; valued at more than one dollar and fifty cents, one dollar each; and in addition thereto on all the above pistols, thirty-five per centum ad valorem.

Metallic mineral substances in a crude state and metals unwrought, not specially provided for in this act, twenty per centum ad valorem; *mica, thirty-five per centum ad valorem.*

Tin, on and after January first, eighteen hundred and ninety-two, there shall be imposed and paid upon cassiterites or black oxide of tin, and upon bar, block, and pig tin, a duty of four cents per pound.

Coke Ovens in the Birmingham District.

Mr. J. T. Hill, manager of the coal mines of the Sloss Iron and Steel Company, at Coalburg, Ala., furnishes the subjoined table, showing the ownership and location of coke ovens in the Birmingham district:

Owner.	Post office address.	Location.	In operation.	Building.
Sloss Iron and Steel Co	Birmingham	Birmingham	285	.....
Sloss Iron and Steel Co	Birmingham	Coalburg Beehive Ovens.	152	.....
Sloss Iron and Steel Co	Birmingham	Thomas patent	64	.....
Sloss Iron and Steel Co	Birmingham	Brookside	99	.....
Sloss Iron and Steel Co	Birmingham	Blossburg	150	.....
Tennessee Coal, Iron and Railroad Co.	Pratt Mines, Ala.	Pratt Mines	806	.....
		Birmingham	250	.....
De Bardeleben C. and I. Co.	Bessemer, Ala.	Bessemer	920	.....
Eureka Coal and Iron Co	Bessemer, Ala.	Oxmoor	100	.....
Woodward Iron Co	Woodward, Ala.	Woodward	223	.....
Woodward Iron Co	Woodward, Ala.	Dolomite	143	.....
Pioneer Mining and Mfg. Co	Thomas, Ala.	Thomas	350	.....
Cahaba Coal Mining Co	Blocton, Ala.	Blocton	357	110
Birmingham Furnace & Mfg. Co.	Wymond, Ala.	Bradford Station	102	.....
Ala. Connellsville Coal and Coke Co.	Connellsville	Connellsville	50	.....
Broken Arrow Coal and Coke Co.	Broken Arrow, Ala.	Broken Arrow	60	.....
St. Clair Coal and Coke Co.	Ragland, Ala.	Ragland, Ala., Thomas patent	10	.....
Milner Coal and Railroad Co.	New Castle, Ala.	New Castle	6	.....
Watts Coal and Iron Co	Warrior, Ala.	Warrior	33	.....
Fort Payne Coal and Coke Co.	Fort Payne, Ala.	Fort Payne	100	.....
Warrior Coal and Coke Co.	Warrior, Ala.	Coaldale, Ala.	16	.....
Standard Coal Co.	Milldale, Ala.	Brookwood, Ala.	.....	200
Mary Lee Coal and Railroad Co.	Birmingham	.....	11	30
Gamble Coal and Coke Co.	Jasper Ala.	Jasper	250	.....
Total	.....	.....	4,557	340

There were only 216 ovens in this district less than a census period ago. Mr. Hill's table shows that there are now 4557, which demonstrates in a very forcible manner the wonderful expansion of the coke and iron business within the period mentioned. Of the above number of ovens 74 are of the Thomas patent, equaling in capacity $2\frac{2}{5}$ beehive ovens, equal to an increase in the number of 105 ovens, giving the district a total of 4662, against 216 ten years ago.

The paper on "Trade Schools," by Col. R. T. Auchmuty, of New York, read before social scientists at Saratoga Springs, brought a matter of grave interest to the notice of the members of the association, and was listened to with attention. He said that the life of the old system was the personal supervision of the master. In old times the master worked with his men. Now, whether his business is large or small, his time can be more profitably spent in superintending his shop, seeking custom or caring for his finances; and the lad is left to the care of journeymen who are not interested in his welfare. No apprentice system by which a lad is bound to serve a term of years, whether by an indenture or by association only, is practicable. The more promising plan is to give the young men the opportunity through trade schools of learning their trade and then ascertain their fitness by examinations. This plan has received the indorsement of the National Association of Master Builders, and has been found to work beneficially in New York and other great centers.

The Demand for Rails.

Robert F. Kennedy, secretary of the Steel Rail Makers' Association, has made a report concerning the laying of steel rails in this country, from which we extract the following:

The total number of tons of rails shipped in 1886 (50 pounds to the yard and upward), was 1,334,051 tons; the sections averaging $61\frac{1}{10}$ pounds to the yard. In 1887 the total was 1,883,649 tons, sections averaging $62\frac{1}{10}$ pounds to the yard. In 1888 the total was 1,120,184 tons, sections averaging 65 pounds. In 1889 the total was 1,271,438 tons, sections averaging $64\frac{4}{10}$ pounds, and from January 1, 1890, to July 1, 1890, the total was 713,205 tons, sections averaging $68\frac{4}{10}$ pounds, showing an increased weight of 1 pound per yard in the average rails laid in 1887 over those laid in 1886; nearly 3 pounds per yard in those laid 1888 over those laid in 1887, while the rails laid in 1889 averaged $\frac{6}{10}$ of a pound to the yard lighter than those laid in 1888, and the rails laid in 1890 were $3\frac{4}{10}$ pounds to the yard heavier than those laid in 1888, or $7\frac{3}{10}$ pounds to the yard heavier than those laid in 1886.

In the tonnage there were 499,598 tons more shipped in 1887 than in 1886, but in 1888 there were 713,465 tons less shipped than in 1887, and in 1889, 51,254 tons more than in 1888. The shipments for the first six months of 1890 were 713,205 tons, while in 1889 but 546,675 tons were shipped up to July 1, showing an increase of 166,530 tons in 1890, and if this be taken as a basis of what will be done during the next six months, it will make the shipments for the year 1890 aggregate 1,426,410 tons, or 154,972 tons more in 1890 than in 1889, equal to an increase of $12\frac{2}{10}$ per cent.

For the purposes of as nearly as possible ascertaining what sections of the country have increased or decreased in the number of rails laid each year, the secretary has prepared tables from which it appears that the increase of rails laid has been regular for the past five years in the Eastern and Middle States. In Illinois and the surrounding States there has been a decrease each year, with the exception of 1887, since then a continual one. In the Southern States there has been a continuous increase each year, excepting probably 1890, which will probably show a decrease of, say, 30,000 tons from 1889. In the extreme Southwestern and Western States the tonnage laid has fluctuated very much, as in 1887 it exceeded 1886 nearly 220,500 tons; in 1888 it was over 300,000 tons less than in 1887, and 90,000 less than in 1886. In 1889 and 1890 the tonnage laid in this district has somewhat increased, say 35,000 tons over that laid in 1888. In the extreme Northwestern States there was a marked decrease of tons laid in 1888 as compared with 1886 and 1887, say 110,000 tons, but in 1889 there was 50,000 tons more laid in this section than in 1888, and the indications are that in 1890 there will be, say 85,000 tons more laid in this section than in 1889. Comparing the years 1886 and 1890, the greatest increase in rails laid appears to be in the Eastern and Middle States, 192,577; the next greatest increase is in the Southern States, 86,583 tons, and the third increase is in the Northwestern States, 19,951 tons, while the Western States show a decrease, 170,872 tons. This would seem to indicate that the increase of tonnage laid has been largely in the States bordering on the Atlantic Ocean and the Northwest, while the decrease has largely been in the Western and Southwestern States.

Owing to the fact that a large quantity of the rails shipped were consigned to individuals, and the inability of the secretary to find out to what roads many of these rails went, he has not been able to compile as accurate a report as he could have wished, but it is believed the foregoing result is so nearly accurate that it may be relied upon for the purposes of the association.

Southern Pig Iron Freights.

The Queen and Crescent route has issued a new rate sheet on pig iron, to take effect September 22. The following are the rates to the leading points :

To	From Chattanooga, Tenn.	From Birmingham, Ala.	From Florence and Sheffield, Ala.	From Anniston, Ala. (via Attalla.)
Akron, Ohio	$3.50	$4.00	$3.75	$4.00
Atchison, Kan	5.00	5.00	...	5.00
Chicago, Ill	3.75	4.00	3.75	4.25
Cincinnati, Ohio	2.25	2.75	2.50	2.75
Cleveland, Ohio	3.50	4.00	3.75	4.00
Columbus, Ohio	3.00	3.50	3.25	3.50
Detroit, Mich	3.75	4.00	3.75	4.25
E. St. Louis, Ill	3.00	3.25	...	3.25
Fort Wayne, Ind	3.50	3.75	3.50	4.00
Kansas City, Mo	5.00	5.00	....	5.00
Louisville, Ky	2.25	2.50	2.25	2.75
Memphis, Tenn	2.00	2.00	....	....
Milwaukee, Wis	4.15	4.40	4.15	4.65
Omaha, Neb	5.00	5.00	...	5.00
Pittsburgh, Pa	3.90	4.40	4.15	4.40
Springfield, Ill	3.75	4.00	3.75	4.25
Steubenville, O	3.90	4.40	4.15	4.40
St. Louis, Mo	...	3.25	....	3.25
Terre Haute, Ind	3.25	3.50	3.25	3.75
Toledo, Ohio	3.50	4.00	3.75	4.00
Wheeling, W. Va.	3.90	4.40	...	4.40

The East Tennessee, Virginia and Georgia Railway has issued a new freight schedule on Southern pig iron, which went into effect September 9. The rates to some of the more prominent Eastern points in carload lots of 17½ tons of 2268 pounds are as follows:

To	From Chattanooga, Tenn.	From Anniston District.	From Birmingham District.	From Florence and Sheffield, Ala.	From Rockwood and Dayton, Tenn.
Buffalo, N. Y.	$4.25	$4.75	$4.75	$4.50	.....
Elmira, N. Y.	5.35	5.85	5.85	5.60	.....
Harrisburg, Pa.	3.61	4.11	4.11	4.21	3.76
Lock Haven, Pa.	4.67	5.17	5.17	5.27	4.82
Norristown, Pa.	4.52	5.02	5.02	5.12	4.67
Pottstown, Pa.	4.52	5.02	5.02	5.12	4.67
Scranton, Pa.	5.13	5.63	5.63	5.73	5.28
Syracuse, N. Y.	5.05	5.55	5.55	5.30	.....
Trenton, N. J	4.80	5.30	5.30	5.40	4.95
Utica, N. Y.	5.55	6.05	6.05	5.80	.....
York, Pa.	3.97	4.47	4.47	4.57	4.12

To	From Chattanooga, Tenn.	From Anniston, Ala.	From Hermitage, Ga. / Etna, / Tecumseh Ala. / Langdon, / Rock Run, / Jenifer, / Columbiana, / Brierfield, / Talladega, / Barclays,	From Shelby, Ala.	From Sheffield, Ala. / Florence,	From Decatur, Ala.	From Ironaton, Ala.	From Round Mountain, Ala. / Gadsden, / Attalla,	From Birmingham, Ala. / Bessemer, / Ensley, / Woodward, / Thomas, / N. Birmingham,	From Dayton, Tenn. / Rockwood,
Boston, Mass.	$	$	$	$	$	$	$	$	$	$
Rail and water	4.50	4.61	4.61	4.86	4.71	4.71	4.61	4.61	4.50	4.65
Providence, R. I.										
Rail and water	4.50	4.61	4.61	4.86	4.71	4.71	4.61	4.61	4.50	4.65
New York, N. Y.										
Rail and water	4.15	4.26	4.26	4.51	4.36	4.36	4.26	4.26	4.15	4.30
Philadelphia, Pa.										
Rail and water	4.15	4.26	4.26	4.51	4.36	4.36	4.26	4.26	4.15	4.30
Philadelphia, Pa.										
All rail	4.55	4.56	4.56	4.81	4.66	4.66	4.56	4.56	4.45	4.60
Baltimore, Md.										
Rail and water	4.00	4.11	4.11	4.36	4.21	4.21	4.11	4.11	4.00	4.15
Baltimore, Md.										
All rail	4.25	4.36	4.36	4.61	4.46	4.46	4.36	4.36	4.25	4.40
Jersey City, N. J.										
All rail	4.75	4.86	4.86	5.11	4.96	4.96	4.86	4.86	4.75	4.90
Wilmington, Del.										
All rail	4.45	4.56	4.56	4.81	4.66	4.66	4.56	4.56	4.45	4.60
Washington, D. C.										
All rail	4.25	4.36	4.36	4.61	4.46	4.46	4.36	4.36	4.25	4.41

Iron from the Birmingham district is subject to an additional charge of $2 per car for switching.

Ship Railway from the Bay of Funday to the Gulf of St. Lawrence.—The following interesting details of the work are given by Sir Benjamin Baker, the chief engineer: "The earthworks and masonry of the docks of this ship canal are being constructed by an American firm of contractors, Messrs. Dawson, Symes & Usher. The machinery, including powerful hydraulic lifts, each capable of hoisting to a hight of 40 feet the total weight—3500 tons—of a ship and cradle, is being manufactured by Easton & Anderson, of London. About two-thirds of the railway and docks are finished. Nearly the whole of the machinery has been made and the greater part shipped to this country. The railroad will be about 15 miles in length. The locomotives for hauling the ship over the railroad are exceptionally powerful, being 8-wheeled tank engines, each weight ing 80 tons. The saving of time in transit will be enormous when you consider that it now takes a ship three days to go from the Bay to the Gulf, while the time occupied on our road will be about two and one-half hours. We have now 1400 men at work and hope that the railway will be opened in the spring of 1892, if not earlier. The Canadian Government has guaranteed the company $170,000 a year for 20 years."

Boston is about to try the virtues of fuel gas. The Boston Gas Company, at the North End station, have a plant embodying the latest improvement in the production of water gas from the cheapest grade of fuel. They propose to utilize one set of distributing mains which belong to the old company, and, if the public takes kindly to the idea, are willing to spend some hundreds of thousands of dollars. If a man living on the line of this pipe is in a manufacturing business in which he wants to melt a little metal of any kind, drive a gas engine, run an occasional stove, or do a bit of occasional cooking, he can make the trial.

It is reported that the Colorado Coal and Iron Company are about to make some extensive improvements at their works at South Pueblo, Col. The contracts have already been let for two large blast furnaces and two ore roasters, and some $500,000 will be expended altogether. These improvements will give the works a daily capacity of 500 tons of pig iron and 350 tons of steel rails. Extensive alterations are also contemplated in the nail and other departments. The new pipe plant, on which $75,000 has been spent, will be ready for operation in the early part of next month.

President Richardson, of the Edge Hill Furnace Company, of Philadelphia, accuses members of the brokerage firm of Potter, Lovell & Co., of Boston, with fraudulently converting to their own use bonds deposited with them as collateral, and they were placed under arrest.

Charles William Greene, manager of the Keystone Furnace, in Jackson County, Ohio, died suddenly in Zanesville, August 29, aged 49 years. He was manager of the Keystone Furnace from 1866 to 1872, and was afterward connected with the management of the Ohio Iron Company to the time of his death, though unable to participate actively for the past two years because of failing health.

TRADE REPORT.

Chicago.

(*By Telegraph.*)

Office of *The Iron Age*, 59 Dearborn street, CHICAGO, September 17, 1890.

The market continues to present the same general characteristics, every line but Pig Iron being fairly active. The scarcity of money operates as a disturbing feature to some extent, but it is evidently not felt here as seriously as in the East.

Pig Iron.—In Pig Iron a little greater activity is apparent, but mainly in the demand for small lots. The purchase of a round lot Southern Mill Iron by a very careful buyer during the past week constituted a good test of the strength of the market. After a thorough canvass of the entire trade here, he bought equal quantities of Gray Forge and Mottled for delivery beginning in December at practically current quotations. Charcoal Pig Iron is very quiet. The makers are not so well sold up that they cannot make provision for further orders; but, on the other hand, leading consumers have not bought as heavily as usual, so that the situation is favorable for a maintenance of values. The furnace companies generally report exceedingly large shipments of Iron to consumers. Some concerns state that their shipments last week were the heaviest in their history. Quotations are as follows, cash, f. o. b. Chicago:

Lake Superior Charcoal	$20.00 @	$20.50
Local Coke Foundry, No. 1	17.00 @	17.50
Local Coke Foundry, No. 2	16.00 @	17.00
Local Coke Foundry, No. 3	15.50 @	16.00
Bay View Scotch	18.00 @	....
Am. Scotch (Strong Soft), No. 1	19.25 @	20.25
Jackson County, Soft and Silvery, No. 1	18.25 @	18.50
Southern Coke, No. 1	16.50 @	....
Southern Coke, No. 2	16.00 @	....
Southern Coke, No. 3	15.50 @	....
Southern, No. 1, Soft	16.00 @	....
Southern, No. 2, Soft	15.00 @	....
Southern Gray Forge	15.00 @	....
Southern Mottled	14.25 @	....
Tennessee Charcoal, No. 1	19.00 @	....
Missouri Charcoal, No. 1	18.50 @	....
Alabama Car Wheel	22.50 @	24.00

Bar Iron.—Inquiries are plentiful and mill agents could secure all the business they cared to take, if they would name the rates current but a fortnight since. The bottom price is, however, 1.85¢, half extras, with very few sellers at that rate. Others ask 1.90¢ and even 1.95¢. The Youngstown manufacturers are firm at 1.75¢ at mill, and are giving their agents no discretion, showing that they have plenty of work or else have confidence in the future. The nature of inquiries now being made shows that consumers have not bought ahead as much as in previous seasons, and the market is feeling the effect of the departure from the custom. Jobbers report a strong demand from the small consumers and continue to quote 2.10¢ @ 2.20¢, full extras, as regular rate with the usual discount to their best trade.

Structural Iron.—The demand is steady. Prices are unchanged, but very firm. The following quotations prevail on carload lots, f.o b.: Angles, 2.35¢ @ 2.40¢; Tees, 2.90¢ @ 3¢; Beams, 3.20¢; Universal Plates, 2.45¢ @ 2.55¢; Sheared Plates, Iron, 2.50¢ @ 2.60¢; Steel, 2.60¢ @ 2.70¢; Car Truck Channels, 2.60¢. Beams sell from store in small lots at 3.70¢, but Angles and Tees at 10¢ @ 15¢ ℔ 100 above carload prices

Plates, &c.—Local trade is large, and the mills are stiffly holding up prices. We quote: Nos. 10 to 14 Iron Sheets, 2.90¢ @ 3¢; do., Steel, 3¢ @ 3.25¢; Tank Iron, 2.65¢ @ 2.75¢; Steel, 2.85¢ @ 2.95¢; Shell Steel, 3.25¢; Flange Steel, 3.50¢; Fire Box Steel, 4.50¢; Rivets, 4¢ @ 4.25¢; Norway Rivets, 40 % off; Tubes, 1¼ inch and less, 40 % off; 2 to 4½ inch, 50 % off; larger, 52½ % off.

Sheets.—Manufacturers' agents report light inquiries for Black Sheets, with No. 27 quoted 3.05¢ @ 3.10¢ at mill. Jobbers are having good trade from store at 3.30¢ @ 3.40¢.

Galvanized Iron.—The market continues active and jobbers are endeavoring to advance quotations to correspond with advances made by makers. They now ask 65 % off for Juniata.

Merchant Steel.—Good orders were booked the past week from implement manufacturers, and Western mining companies bought Tool Steel in large quantities. The Implement trade in Steel is very nearly over for the present, but the mills are now so well supplied with orders that prices are not in much danger of going off. The situation has also been greatly helped by the recent reduction in the number of makers of Mild Steel. Tire Steel, 2.50¢ @ 2.75¢; Open Hearth Spring, 2.75¢ @ 3¢; Open Hearth Machinery, 2.50¢ @ 2.75¢; Bessemer Machinery, 2.30¢ @ 2.40¢; Crucible Spring, 3.50¢; Tool Steel, 7¢ and upward; Crucible Sheets, 7¢, 8¢ and 10¢.

Steel Rails and Fastenings.—The Rail trade is in good shape, with manufacturers booking orders every day. Inquiries latterly received show that numerous railroad managers are considering the policy of taking up old Rails and buying new Steel Rails now while they are cheap and old Rails dear. As soon as money is easier it is probable that much more business will be done and prices may probably advance. The regular quotation is $33.50. Splice Bars are selling freely, and some large orders have been booked since last report at 2¢ @ 2.10¢ for Iron and 2.25¢ for Steel. Track Bolts with Hexagon Nuts are quoted 3.15¢, with 3.10¢ named as a very close price. Spikes sell at $2.20 @ $2.25.

Old Rails and Car Wheels.—Very light sales have recently been made in this market at $26.50 @ $26.75 for Iron Rails; $18.50 @ $22 for Steel Rails, and $19.25 for Car Wheels.

Scrap.—Reports of weakness are current, but the effect has not yet appeared in dealers selling prices, which are quoted per net ton as follows: Selected Heavy Wrought for re-rolling, $23.50; No. 1 Railroad Wrought, $22 @ $22.50; No. 1 Forge, $21 @ $21.50; Car Axles, $26.50@ $27; No. 1 Mill, $17; Pipes and Flues, $16; Cast Borings, $9.50; Axle Turnings, $14; Machinery Cast, $14.25; Horse Shoes, $19.50; Mixed Steel, $14.25; Coil Steel, $18; Leaf Steel, $19; Tire Steel, $20.

Pig Lead.—The past week's sales reached 1000 tons in this market, and the demand for Shot Lead, it is said, cannot be satisfied. Values advanced from 4.70¢ to 4.85¢, with 4.85¢ now asked.

St. Louis.

OFFICE OF *The Iron Age*, 214 N. Sixth st., ST. LOUIS, September 15, 1890.

Pig Iron.—The demand has fallen off considerably since our last report, and prices are shaded to secure orders. Consumers apparently anticipate a lower range of prices—at least we judge so from the fact that recent purchases have all been small quantities for immediate shipment. Inquiries are not so numerous as expected, and as some of the Southern furnaces are a trifle anxious for business, concessions are frequently made to secure what little trade there is at present obtainable. No. 1 and No. 2 Southern Foundry Irons are in better shape, so far as price is concerned, than the cheaper grades, which, however, is accounted for from the fact that the scarcity of the former, which has prevailed for some three months past, still continues. The following quotations indicate the condition of the market, and are quoted for cash, f.o.b. St. Louis:

Southern Coke, No. 1 Foundry,	$15.75 @	$16.00
Southern Coke, No. 2 Foundry,	14.75 @	15.00
Southern Coke, No. 3 Foundry,	14.25 @	14.50
Gray Forge	13.75 @	14.00
Southern Charcoal, No. 1 Foundry	17.75 @	18.25
Southern Charcoal, No. 2 Foundry	16.75 @	17.25
Missouri Charcoal, No. 1 Foundry	16.75 @	17.25
Missouri Charcoal, No. 2 Foundry	16.00 @	16.50
Ohio Softeners	17.75 @	18.50

Bar Iron.—The volume of business is large, and there is some talk of advancing prices. Lots from store command 2.05¢ @ 2.10¢. Mills quote 1.95¢.

Barb Wire.—There is a fairly active demand for Barb Wire, with a trifling weakness in prices, caused by competition with outside mills who are anxious to get into this territory. Local mills are fairly well supplied with orders, and are not disposed to shade prices, except in extreme cases. We quote as follows: Painted, 3¢ @ 3.05¢; Galvanized, 60¢ additional; carload lots, 10¢ ℔ cwt. less than above prices.

Cincinnati.

(*By Telegraph.*)

Office of *The Iron Age*, Fourth and Main Sts., CINCINNATI, September 17, 1890.

Pig Iron.—Recent reports from the South are encouraging for the manufacture of Pig Metal, while consumption has continued at full speed under a high pressure for Finished Iron. Production has been less heavy, being now at a less rapid rate than during the summer. Private advices note a decrease of 35,000 tons in stocks at furnaces both North and South during August. For some months past there has been a steady downward tendency of prices on certain grades for special reasons, but the decline has been so low or rather so gradual as to be scarcely perceptible, and only a strict comparison of prices and conditions shows the real drift of the market. The known heavy output of the furnaces has doubtless been the prime factor in causing this tendency, but the active demand now bids fair to outrun the influence of large production and so turn the tide. Mill Iron, as previously noted, has continued a prominent feature of the market during the past week. Orders for Foundry grades have been only moderate, and the movement of Softeners has been fair. Not a few of the Southern furnaces are behind in the fulfillment of orders placed some time since. This is due to the inadequate shipping facilities afforded by some railroads which have suffered by labor troubles. Just at present there is a lack of cars, and complaints are numerous and annoying. The situation is gradually improving, however. The sales of Charcoal Iron are larger in the aggregate, but the individual transactions do not call for larger amounts. There is a good inquiry for old material, with sales of Old Car Wheels at $19 @ $19.50 ℔ ton. Orders for Muck Bar are large, active and pressing. Among the more important sales of the past week are the following: 1100 tons Mottled at $10.25, 600 tons do. at $10.25, 1400 tons Gray Forge at $10.50, 1000 tons do. same rate, 500 tons do. at $10.40, 500 tons do. at $10.75, 300 tons do. at $10.50, 600 tons No. 2 Soft at $11, 250 tons No. 1 Soft at $11.50 @ $12, 980 tons No. 3 Foundry at $11, and 250 tons Silvery at $11.25 ℔ ton, all cash, Birmingham basis. At the close additional sales of 5000 tons of Gray Forge, No. 1 Soft and Silvery Irons are reported on same basis in lots of 2000, 1000 and four 500

tons. Sales of Charcoal Iron aggregate about 1000 tons The prices current are cash, f.o.b. Cincinnati, as follows:

Foundry.

Southern Coke, No. 1	$15.25 @ $15.75
Southern Coke, No. 2	14.25 @ 14.50
Southern Coke, No. 3	13.75 @ 14.00
Ohio Soft Stone Coal, No. 1	17.00 @ 17.50
Ohio Soft Stone Coal, No. 2	16.00 @ 16.50
Mahoning and Shenango Valley	17.50 @ 18.00
Hanging Rock Charcoal, No. 1	21.00 @ 22.00
Hanging Rock Charcoal, No. 2	19.50 @ 20.50
Tennessee and Alabama Charcoal, No. 1	18.00 @ 19.00
Tennessee and Alabama Charcoal, No. 2	18.50 @ 19.50

Forge.

Gray Forge	13.25 @ 13.50
Mottled Neutral Coke	13.00 @ 13.25

Car Wheel and Malleable Irons.

Southern Car Wheel	22.50 @ 23.25
Hanging Rock, Cold Blast	22.00 @ 22.50
Lake Superior Car Wheel and Malleable	21.00 @ 22.00

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., September 16, 1890.

Pig Iron.—The market is fairly active in small and medium sized lots, besides which there is a great deal of inquiry from large buyers. Their bids, however, are at very low figures, and to secure business of that kind sellers are compelled to make liberal concessions. It cannot be said that there has been any general marking down in prices, but it has been found impossible to secure even the merest fraction of an advance, and now the difficulty is to maintain the rates recently ruling. Consumption is very large—unquestionably the largest on record—but production is a little ahead, and will probably show further gains as the season advances. The reverse may be expected as regards consumption, as new business during the past few weeks has not been nearly as important as inquiries for bids at one time seemed to indicate. Of course the contracts may yet be given out, but business that was very confidently calculated upon two or three weeks ago is now held in abeyance for further consideration. Still, as we have already said, consumption is enormous and well distributed, and for the present there is very little danger of slackness in the Finished Iron trade, but to keep pace with Pig Iron there should be a constantly growing demand. This can hardly be expected, and if present appearances are to be relied upon, the point for a reaction is not far distant. As regards Pig Iron, some very nice sized lots of Gray Forge have been taken at $15.25, delivered, and of Foundry No. 1 at $18, but these were brands that the parties were willing to pay the price for, and, as a matter of fact, at these low prices, 25 @ 50¢ less is no inducement for consumers to change their mixtures. Ultimately new brands, or whatever they may be, are bound to have an effect on the market; but as yet they have done little more than prevent an advance. But there has been no special effort to realize on outside brands recently, and although it is well understood that such could be had at, say, $14.50, delivered, for Gray Forge, $16 for No. 2, and probably $17 for No. 1, these figures do not tempt the majority of consumers. Those who would take 1000 @ 5000 ton lots would require still lower figures for these Irons, while those whose requirements are on a smaller scale would sooner pay regular rates for regular brands. For the time being, therefore, its a "standoff" on both sides, such lots as are taken being on the basis of $15 @ $15.25, delivered, for Gray Forge, $16.50 @ $17 for No. 2 and $17.50 @ $18 for No. 1, with a very considerable inquiry and prospects of moderate sales at about the figures named.

Bessemer Pig.—There is no general demand, so that prices are nominal at $18.50 @ $19 at furnace. A few small lots are said to have been taken at about $18.50, but it would require lower figures than these to secure the attention of large buyers. Furnaces are well sold ahead, however, and makers are not urging sales, as such a course would probably depress prices without increasing the volume of business.

Spiegel and Ferromanganese.—No inquiry for Spiegel, but sellers quote about $30.50 @ $31 for 20 %, duty paid. Ferro sells in small lots at $70 @ $71, duty paid, for 80 %.

Steel Rails.—The market is a little dull, and owing to the stringency in the money market large operations are not likely to be entered into for the present. There is a moderate demand for small lots, and for such prices are quoted $31 @ $31.50 at mills, with sales pretty well on a level with the week's deliveries. There are intimations, however, of transactions at little if anything over $30 at mills, and there is not much reason to doubt that cash offers for good sized lots would be very favorably considered at this season, and under present conditions.

Steel Billets.—The market is unsettled and easier. There is a fair demand, but buyers demand liberal concessions, which in most cases are made available when large lots are called for. Sales of large sizes are reported at a trifle over $33, delivered, but 4 x 4s are offered at $32 @ $32.50, and Nail Slabs at $31.50, without securing any large amount of business. Bids at 50¢ less would doubtless be accepted for good deliveries and cash payments. Slabs for Boiler Plates have been sold at $38 @ $40, delivered, according to guarantee of quality, &c.

Muck Bars.—There is practically no business doing. Those who are in a position to make immediate deliveries quote $30 @ $30.50, at mill, but buyers are not over $29.50, delivered. With comparative weakness in other specialties, Muck Bars seem too high at the figures named.

Bar Iron.—There is plenty of work on for the present, but new business has not been coming in as rapidly as it did a little while ago. Prices worked up to 1.85¢ @ 1.90¢ at city mills, and 1.80¢ @ 1.85¢ at interior points, and these figures are still quoted, but the demand is less active, and large buyers require more or less of a concession before they will enter into new engagements. The hesitation may be only temporary, but a good deal will depend on the course of the money market, which is beginning to have its effect on the manufacturing industries as well as in other directions.

Skelp Iron.—Mills are very full of work, and in most cases 1.95¢ @ 2¢ is quoted for Grooved and 2.15¢ @ 2.25¢ for Sheared. Prices are very firm, and those who must have early deliveries will probably have to pay outside prices, but for later dates inside figures might be accepted for moderate quantities. Last sale of Grooved was 500 tons at 1.97½¢, and 2.10¢ at mill, equal to 2.20¢, delivered, is bid for several 500 ton lots of Sheared.

Plates.—The mills are very much crowded with work and a considerable demand for Iron Plates is still unsatisfied. Notwithstanding the delay in closing certain lots that have been inquired for, there is an active business in all directions, and as regards the Plate mills, there is every reason to expect full employment for a long time to come. Prices are firm at last week's rates, which for lots delivered in consumers' yards are about as follows:

	Iron.	Steel.
Ship Plates	2.25 @ 2.30¢	2.40 @ 2.50¢
Tank	2.25 @ 2.30¢	2.40 @ 2.50¢
Bridge Plate	2.30 @ 2.40¢	2.50 @ 2.60¢
Shell	2.45 @ 2.55¢	2.60 @ 2.70¢
Flange	3.10 @ 3.20¢	2.90 @ 3.00¢
Fire-Box	3.75¢	3.75 @ 4.25¢

Esherrick, Cotton & Co., of this city, have received an order for several carloads of Iron Plates for shipment to England, and which are to be used in constructing work that will be erected in London, England.

Structural Iron.—There is no material change in this department, nor is there any probability of change while the mills are all as full of work as they now are. New business is probably not as urgent as it was a few weeks ago, but mills have all the business they can handle this year, while with some it extends well into next year. Prices are firm at last week's quotations, delivered in consumers' yards: Angles, 2.20¢ @ 2.30¢, delivered; Sheared Plates at 2.40¢ @ 2 50¢, and from 10¢ to 20¢ more for Steel, according to requirements. Tees, 2.7¢ @ 2.8¢; Beams and Channels, 3.1¢ for either Iron or Steel.

Old Rails.—The market is practically at a stand, as there is neither demand nor supply of any account. Nominal quotations are $25.50 @ $26, Philadelphia, and about the same rates delivered at any point within a radius of 100 miles of this city.

Sheet Iron.—The activity noted for many weeks past is fully maintained; the great trouble is to make deliveries as promptly as required. Prices are firm and for carload lots are quoted as follows:

Best Refined, Nos. 14 to 20	3.00¢ @ 3.10¢
Best Refined, Nos. 21 to 24	3.20¢ @ 3.30¢
Best Refined, Nos. 25 to 26	3.40¢ @ 3.50¢
Best Refined, No. 27	3.50¢ @ 3.60¢
Best Refined, No. 28	3.60¢ @ 3.70¢

Common, ¼¢ less than the above.

Best Soft Steel, Nos. 14 to 20	3¼¢ @ 3½¢
Best Soft Steel, Nos. 21 to 24	3⅜¢ @ 3¾¢
Best Soft Steel, Nos. 25 to 26	3¾¢ @ 3¾¢
Best Soft Steel, No. 27	4¢ @ 4¼¢

Best Bloom Sheets, 1-10¢ extra over the above prices.

Best Bloom, Galvanized, discount	@ 60 %
Common, discount	60 @ 65 %

Scrap Iron.—There is a fair demand and sales are chiefly at prices about as follows: No. 1 Railroad Scrap, $22.50 @ $23; No. 1 Wrought, $21 @ $21.50, Philadelphia, or for deliveries at mills in the interior, $22.50 @ $23, according to quality and point for delivery; $16 @ $17 for best Machinery Scrap, $15 @ $15.50 for ordinary, $15.50 @ $16.50 for Wrought Turnings, $11 @ $11.50 for Cast Borings, $26 @ $28 for Old Fish Plates, and $17 @ $18 for Old Car Wheels.

Wrought Iron Pipe.—The heavy demand shows no sign of abatment. The retailers are having an unusually prosperous season, and the mills find great difficulty in meeting the requirements of the trade promptly. Discounts are as follows: Butt-Welded Black, 47½ %; Butt-Welded Galvanized, 40 %; Lap-Welded Black, 60 %; Lap-Welded Galvanized, 47½ %; Boiler Tubes, 1¼ inches and smaller, 45 %; 2 inches and larger, 50 %; Oil Well Casings, 50 %.

Louisville.

LOUISVILLE, KY., September 15, 1890.

Pig Iron.—There has been steady buying during the past week with sales of some moment, several transactions of 1000 tons each having been made. The demand for prompt shipment is heavy and a few buyers are in the market for deliveries running for the first six months of next year. There has been no advance in prices, owing to the stringency of the money market, which is also having its effect on buyers, as toward the close of the week they felt that it was uncertain whether the heavy demand for finished Iron might cantinue, and in case it fell off, believed that purchases for future wants might not be wise. The price at which Iron is being offered, however, is so low that it is thought there can be no harm resulting from ordinary purchases,

even if trade becomes very quiet. It is a very unusual spectacle that presents itself, Finished Iron selling higher than it did last fall, when Iron was over $3 a ton higher than now, and Pig Metal continuing low. The situation among furnaces is such that as soon as money is easier it will be almost impossible to keep the price of Iron at the present basis, as furnaces have small stocks, are being rapidly sold up, and before long it will be a question of obtaining the Iron, provided the present demand continues, which is bound to increase the prices.

Cleveland.

CLEVELAND, September 15, 1890.

Iron Ore.—Receipts of Ore at lower lake ports to date slightly exceed 5,600,000 tons, as compared with 4,780,000 tons at a corresponding period last year. Vesselmen are complaining bitterly of the delay in getting Ore cargoes at Lake Superior ports, and several vessels are likely to be tied up this week on that account. The non-Bessemer trade is practically over, several lots of odds and ends having been sold during the past ten days at figures equivalent to $4.20, f.o.b. vessels, Cleveland. Bessemer Ore in splendid demand, with prices somewhat firmer than for several weeks past. One small sale of 60 % high in iron is reported at $5.70, but the Ore men seem holding their products for the close of the season, hoping for fancy prices.

Pig Iron.—Sales of No. 1 Foundry at $17, cash, at the furnace are reported, and also of Bessemer Iron at $18.50, same conditions. The demand for Charcoal Irons is enormous, but so much work is on hand that no orders can be booked. A trifling sale at $21 indicates the strength of the market. The whole Pig Iron market is firm and steady, with indications of an advance in prices in the very near future. Furnacemen complain of the enormously high prices demanded by the cokemakers, but still buy freely in order to be ready to meet any emergency that may arise.

Scrap.—No. 1 Wrought is still in good demand at $22.50. Wrought Turnings range in value from $14.50 to $15.50. Cast Scrap is not in great demand. Selected Axles at $27.50 are selling quite freely.

Manufactured Iron.—Prices are still climbing upward. Common Bar is now worth 1.80¢, at the mill, but manufacturers are crowded with work and can only book orders for delivery after Christmas. Billets and Muck Bar are also in great demand.

Old Rails.—Sales of Old Americans at $27.50 are reported and even $28 is said to have been paid for a small order for immediate delivery.

Detroit.

WILLIAM F. JARVIS & Co., under date of September 15, 1890, report as follows: A very moderate amount of business in small lots (carloads and 50 tons), and no large transactions whatever have taken place during the past week. To offset this to a certain extent, however, a number of good sized inquiries are in hand, chiefly confined to Lake Superior Charcoal Pig Iron. These inquiries are from manufacturers who depend upon lake navigation for cheap rates, so that should they result in actual transactions the material would be sold only for prompt delivery. In view of the fact that nearly every Charcoal furnace is closely sold up, it is fair to suppose that these transactions will be at full market rates, and possibly at some advance. For manufactured material all of the mills report that they are overcrowded with work, and prices are accordingly on the advance. Bar Iron is scarce at $1.80 rates. Market quotations for Pig Iron are as follows:

Lake Superior Charcoal, all numbers	$20.50 @ $21.00
Lake Superior Coke, Bessemer	20 00 @ 20.50
Katahdin (Maine Charcoal)	24.00 @ 25.00
Lake Superior Coke Foundry, all ore	19.25 @ 20.75
Southern No. 1	17.00 @ 17.50
Southern Gray Forge	15.25 @ 15.50
Jackson County (Ohio) Silvery	19.00 @ 19.25

Pittsburgh.

Office of *The Iron Age*, Hamilton Building, PITTSBURGH, September 16, 1890.

River navigation has again been resumed to the great satisfaction of manufacturers, the railroads having been unable to do the business offering here with any satisfaction.

Pig Iron.—Notwithstanding the continued activity in finished products, the market for raw Iron continues weak and prices have still further declined. A good many furnacemen, however, are not particularly anxious to make contracts at present prices. Consumption was probably never larger in this district than at present. Every available puddling furnace is being worked up to its full capacity, and this is likely to continue for some time to come. Prices may be fairly quoted as follows:

Neutral Gray Forge	$15.00 @ $15.25,	cash.
All Ore Mill	15.75 @ 16.25,	"
White and Mottled	14.00 @ 14.50,	"
No. 1 Foundry	17.00 @ 17.50,	"
No. 2 Foundry	16.25 @ 16.50,	"
No. 1 Charcoal Foundry	23.50 @ 24.00,	"
No. 2 Charcoal Foundry	21.50 @ 22.00,	"
Cold Blast Charcoal	27.00 @ 30.00,	"
Bessemer Iron	18.00 @	"

Bessemer Pig is now being offered freely at $18, cash, and it is rumored that some has been sold for less. No. 1 city brands of Forge Iron are selling at $15.25. Foundry trade continues fair, with prices in favor of the buyer.

Muck Bar.—There appears to be no abatement in demand, and for immediate or nearby delivery the mills are nearly all oversold. Usually the demand commences to fall off about this season of the year. It is claimed that some contracts have been made recently covering all the winter months. We continue to quote at $30 @ $30.75, cash, as to quality and delivery, although for prompt delivery $31 might be realized.

Ferromanganese.—Small sales of 80 % domestic are reported at $73 @ $74 ℔ ton. Foreign can be laid down here from the seabord below the prices quoted, but on account of the wastage while in transit many consumers prefer the domestic, even if they have to pay a little more for it.

Manufactured Iron.—The mills continue very busy and but few of them are in condition to take orders for immediate delivery. They nearly all got behind in the summer, when the men could not work in consequence of the intense heat, and have not been able to catch up since. Prices remain as last quoted. Bars, 1.85¢ @ 1.90¢; Plate and Tank, 2.20¢ @ 2.25¢; No. 24 Sheet, 2.85¢ @ 2.90¢; 1.80¢ @ 1.85¢ for Grooved Skelp and 2.10¢ @ 2.15¢ for Sheared, all 60 days, 2 % off for cash.

Structural Iron.—While there is not a great deal of new business, the mills are all pressed to fill former contracts, and will be for some time to come, contractors being anxious to push the work as rapidly as possible on account of the approach of the winter season, when outside work will have to be suspended. Prices are firm but unchanged: Angles, 2.25¢; Beams and Channels, 3.10¢; Tees, 2.80¢ @ 2.85¢; Steel Sheared Bridge Plates, 2.65¢ @ 2.70¢; Universal Mill Plates, Iron, 2.35¢; Refined Bars, 1.90¢ @ 2¢.

Steel Plates.—The mills are all very busy with contracts that will keep them fully employed for some time to come. Prices remain unchanged as follows: Fire Box, 4.25¢ @ 4.75¢; Flange, 3.10¢ @ 3.20¢; Shell, 2.90¢; Tank, 2.50¢ @ 2.55¢.

Merchant Steel.—There is a continued demand, but no change in prices. Tool Steel 8¢ upward; Crucible Machinery Steel, 4.75¢ @ 5¢; Open Hearth Steel, base sizes, 2.75¢ @ 3¢; Bessemer Machinery Steel, 2.35¢ @ 2.40¢; Tire Steel, 2.50¢ @ 2.55¢.

Wire Rods.—There have been no sales reported recently, in the absence of which we continue to quote at $44 @ $45, cash, at sellers' mill. The mills here have about all they can do to supply Nail and Wire factories with which they are connected, and there are very few Rods for sale.

Wrought Iron Pipe.—There is nothing especially new to report. Pipe mills continue very busy and it is difficult to place an order on immediate or nearby delivery. Prices are firm, but unchanged. Discounts on Black Butt Weld, 47½ %; Galvanized ditto, 40%; Black lap Weld, 60 %; Galvanized ditto, 47½ %; Boiler Tubes, 1¼ inches and smaller, 45 %; 2-inch and larger, 50 %; Casing, 50 % off.

Nails.—There does not appear to be much inquiry for Cut Nails, and prices are easy, but unchanged. Steel are quoted at $1.85, 60 days, 2 % off for cash, and Iron 10¢ ℔ keg less. There is a continued good demand for Wire Nails, and all three factories here are well booked up. Prices, however, are easier, and while we continue to quote at $2.40, 60 days, it is intimated that for desirable orders the price quoted is being shaded.

Old Rails.—There have been sales during the past week at $28 @ $28.25 for American Tees, delivered at valley mills. At present there appear to be no buyers here. Old Steel Rails are reported weaker, and in the absence of sales may be quoted at $21 @ $22.

Billets and Slabs.—But few of the mills here are in condition to sell; some of them have been buying. There does not appear to be much inquiry. In the absence of sales we continue to quote at $30 @ $30.50 for Billets. We hear of a sale at Wheeling at $29.50 on cars there, which with 75¢ freight added would be equal to $30.25 in Pittsburgh. It is a little strange that Iron Muck Bar is worth as much as, if not a little more than, Steel Billets, but such is the case.

Railway Track Supplies.—There is a very good demand, but prices remain unchanged: Spikes, $2.15, 30 days, on cars at works; Iron Splice Bars, $1.95 @ $2.05; Steel ditto, $2 @ $2.10; Iron Track Bolts, $2.85 with Square and $3 with Hexagon Nuts.

Steel Rails.—There has been but little new business of late, but both of the mills here are well sold ahead, and have all they can do; prices are quoted at $31 @ $32, cash, at mill. Some small sales of "seconds" are reported at $30.50 @ $30.75. There is now a difference of from $3 to $3.50 ℔ ton between old Iron and new Steel Rails, in consequence of which many are taking advantage of the situation by taking up the former and relaying with new Steel Rails.

Old Material.—There is a continued fair demand for No. 1 Railroad Wrought Scrap at $22.50, net; No. 1 Wrought Turnings quoted at $14 to $15; Car Axles, $28.50 @ $29.50; Cast Scrap, $15.50 @ $16; Old Car Wheels, $18 @ $18.50. Steel Bloom and Rail Ends are weaker at $21 @ $22.

Connellsville Coke.—There is a continued scarcity of cars, and this is about

the only complaint made by operators. Demand continues good, while prices remain unchanged.

(By Telegraph.)

Pig Iron continues weak. It is said that good Forge Irons are to be had at $15, cash. While no sales of Bessemer Pig have been reported below $18, cash, it is intimated that it can be had for less. A sale of 5000 tons Muck Bar is reported, to be delivered during the next four months, at $30 @ $30.25, cash. Old Iron Rails are stiff at $28.

The foundry of the Totten & Hogg Iron and Steel Foundry Company was partially destroyed by fire this morning. Will be rebuilt on a large scale. The filling of orders will not be interrupted.

Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts., CHATTANOOGA, September 15, 1890.

Pig Iron.—Notwithstanding the slight easing off in prices, there is a larger demand for Pig, especially for Nos. 1 and 2, and the furnaces are not fully able to supply the demand, and on these grades there appears to be no concession—that is, for brands that are known to be good. A new feature is likely to appear in the demand for Gray Forge in the near future. Such has been the growing scarcity of Old Rails that the Southern mills are now turning their attention to largely increasing their capacity for making Muck Bar, and nearly all of them are putting up more puddling furnaces. In addition to this there are beginning to be a great many inquiries from Northern mills in relation to the special article of Muck Bar. The demand for Bar Iron is more than the capacity of the mills to meet, and as a general thing their order books are filled for the next two or three months. Railroad Spikes and Fish Plates are also in great demand, with more orders than the mills can promptly respond to. The season for the transportation of Cotton is now upon us, and the demand for cars is beyond the capacity of the lines, and the consequence is that the transportation of Pig Iron has also to suffer in proportion.

New York.

Office of *The Iron Age*, 66 and 68 Duane street, NEW YORK, September 17, 1890.

American Pig.—The New York market is practically in the control of the Northern furnaces, the Southern companies generally asking prices for Foundry grades which are higher than well-known brands of Northern iron equivalent or superior in quality. From the West comes the report that stocks on September 1 were 35,000 tons lower than on August 1. This, however, is largely due to the falling off in the supply on hand of a large rail plant. Still, the report shows that the current consumption was capable of coping with production, in spite of the drawbacks caused by the hot weather of August. We continue to quote $17 @ $18 for No. 1 and $16 @ $16.50 for No. 2 Foundry, good Northern brands, while Southern Irons are selling at $17 @ $17.25 for No. 1, $16 @ $16.25 for No. 2 and $14.75 @ $15.25 for No. 3. Southern Car Wheel Iron is quoted $20.50 @ $21 for Nos. 3, 4 and 5, and $19.50 @ $20 for Nos. 1 and 2, delivered.

Spiegeleisen and Ferromanganese.—The market is exceedingly dull, with only occasional small transactions in Ferromanganese at declining prices. We quote 20 % Spiegeleisen, $30 @ $30.50, and 80 % Ferro, $69 @ $70.

Wire Rods.—There is no chance of doing any business in foreign Rods, while domestic Rods are selling in a moderate way at $43.50 @ $44, at sellers' mill.

Billets.—There have been rumors that one of the leading Eastern mills has been cutting the market considerable under the parity of prices in the West, which is $32.50 @ $33.

Swedish Material.—The market shows a declining tendency, and importers are willing to make concessions for future delivery considerably under the prices at which the material can now be laid down. We learn also of an effort to place a round block of Rivet Rods, apparently purchased on speculation some time since. We quote Rivet Rods $60.50 @ $64, according to time of delivery.

Steel Rails.—So far as the Eastern mills are concerned the market has been exceedingly quiet, and the outlook is regarded as somewhat unsatisfactory. Orders are coming in very slowly and in a quiet way are being sharply competed for. It is acknowledged that $30 has been done, and it is believed that a price even lower than that has been accepted. That is undoubtedly the case should the statement prove correct that an Eastern mill has taken a 5000 ton order for Chicago delivery. The evidences are accumulating that the active mills are growing restless, and that the conviction is spreading that lower prices will prevail for winter work. Considering the circumstances, the eagerness to book orders for winter work is not so great this year as it has been under similar conditions in the past; but it is idle to deny that the feeling does exist to some extent now and that it is perceptibly growing. Some of the daily newspapers have reported some exceptionally low sales for delivery in the vicinity of Pittsburgh. We are assured that this probably grows out of a transaction in seconds. The report of the Board of Control shows quite a satisfactory volume of business, the deliveries up to September 1 having been 942,984 gross tons, while the sales for 1890 delivery are reported at 1,353,904 gross tons. The 25,000 ton Union Pacific order has been postponed.

Manufactured Iron and Steel.—Plates continue very active, there having been a sale of a 500 ton lot of Iron Tank Plates at 2.25¢, and a lot of 500 tons of Steel Tank at private terms. Steel Tank is now quoted 2.60¢; Shell, 2.65¢ @ 2.85¢; Flange, 3.05¢, and Fire Box, 4.25¢. Wrought Finished Steel Shafting is quoted 2.10¢ @ 2.20¢, at mill, and Machinery Steel, 2.10¢ base, at mill.

Old Rails.—The market is very quiet, buyers not being willing to pay the prices now generally asked, $25.50 @ $26 for Tees. Importers cannot now do anything for Western delivery, because it is too risky to attempt to ship by canal.

Scrap.—We note two sales of 500 ton lots of Prime Selected Railroad Scrap at private terms.

Warrant Stocks.—The American Pig Iron Storage Warrant Company report as follows:

	Tons.
Stock in yard, September 10	67,100
Put in yard six days ending September 16	300
Total	67,400
Withdrawn six days ending September 16	1,700
Net stock in yard, September 16	65,700

Financial.

The general business situation has been mixed and unsettled, chiefly owing to disturbing influences in the money market. Wall street speculators naturally looked to Washington for relief, and in response to urgent solicitations, Secretary Windom instructed the Departments to advertise for offers of $16,000,000 4% bonds and to pay at once interest on the 6s for the present year This will, it is thought, bring out speedily not less than $16,000,000, and alleviate the temporary stringency. Another measure of relief is the assurance given in official quarters that the date for withdrawing goods from bonded warehouses will be fixed at February 1. With reference to this subject of excessive importations and accumulated merchandise, there has been very much of erroneous statement, as proved by Custom House figures. It has been shown on satisfactory authority that on July 1, 1888, the whole value of merchandise in the bonded warehouses of the United States was $40,777,394, and with the whole of July's receipts added the total was only $45,994,673 on the 1st of August. During the month of August the withdrawals at this port were $8,553,023, so that the stock in bond actually decreased two million dollars. There is, therefore, in this matter nothing on which to found a panic. In truth, the Wall street operators have only sought the most convenient pretext for obtaining aid in speculative ventures, entered upon to a great extent in anticipation of silver inflation. Banks and other institutions, availing themselves of the opportunity to realize high rates for money, have allowed their resources to reach the lowest ebb, and a return to the normal monetary condition may be deferred for some time to come, until disturbing influences are removed. Secretary Windom is admitted to have spoken advisedly when he said with reference to the demand for money: "In my judgment it is attributable mainly to the remarkable activity in business of all kinds, in connection with the great advance in values during the last 18 months. The increase in values on September 1 of three products of agriculture—wheat, corn and oats—based upon the crop and prices of 1889, amounted to over $700,000,000; and if to this be added the increased price of all other products of industry, the total increase for this year will doubtless largely exceed $1,000,000,000. This increase of values necessarily requires a much larger amount of money to handle the products, and hence the unusual demand from the South and West." Whether the disbursement of additional millions would silence the calls for more money may well be questioned. A measure of relief through natural channels may be relied upon when the enormous cotton crop moves forward to market. For the export of cereals the outlook is not hopeful so long as the markets of Europe remain so near a parity with our own as at present. In any event recourse to the Government Treasury as a means of relief is liable to become a vain dependence, as the Secretary has distinctly intimated.

The stock market was unsettled and bearish during the week, owing to stringent money Measures adopted by the Treasury for relief had only a temporary effect. On Friday Sugar Trust broke on the announcement that a dividend would be deferred until after the final organization. On Saturday the market was feverish and weak. The Collector of Customs made an estimate that only about $9,000,000 would be required to pay the duties on goods bonded before September 1, wuich tended to relieve apprehension.

Quotations of United States bonds are:

U. S. 4½s, 1891, registered	104¼
U. S. 4½s, 1891, coupon	104¼
U. S. 4s, 1907, registered	125
U. S. 4s, 1907, coupon	126
U. S. currency 6s, 1895	114

The range for money on call during the week was 186 and 3 %, but the average was about 10 %. Time loans continued to be quoted at 6 % for all dates, and nothing was done in commercial paper. The bank return of Saturday showed a loss of $3,192,900 in cash and of $1,905,-

800 in reserve, leaving the banks $3,306,925 below the limit of 25 % reserve to liabilities.

The posted rates for bankers' sterling are $4.82 @ $4.85¼. The market is demoralized by the stringency in money.

General trade has been influenced by monetary conditions, but is in good volume. Breadstuffs advanced on the Government report, and news of severe weather in the West caused a nervous feeling, but on Monday the market was weak and decidedly lower. Corn, wheat and oats moved together in sympathy, with heavy realizing sales. Prospects for corn were said to be better. With dry goods jobber the market is firm. A good season has already been realized, and less disturbance is felt on account of the money outlook. Cotton movements have been steadily widening, but at easier prices, since the receipts of the new crop have been full.

The Government crop reports show that the average for corn is 70.1, the lowest since 1881. The average for both spring and winter wheat is 75. The rye crop is small, and the condition of oats is the lowest ever reported. Barley promises a fair crop, and tobacco has improved materially during the month. The general average of cotton is reduced to 85.5.

The clearings of 53 cities for the week show an increase of 8.5 %. New York gained 4 %; Boston, 8.4 %; Chicago, 21.5 %; Philadelphia, 5.1 %; St. Louis, 12.5 %; Baltimore, 37.7 %; Pittsburgh, 32.2 %; Cincinnati, 15.4 %; Kansas City, 14.9 %; Milwaukee, 56.4 %; Buffalo, 192.3 %.

The returns of the commerce of this port for August show a decline both as to imports and exports compared with last year. The former amount to nearly $42,000,000, against $43,805,832 in 1889. Of the merchandise in bond about half is tobacco, representing about $9,000,000. Exports for August amount to $29,078,000, as compared with $31,544,000 last year, exclusive of specie. The total imports for eight months from January 1 are $371,607,900, and the exports $259,981,300.

East-bound shipments for the week were heavy, both by rail and lake. The total by all roads was 72,520 tons, an increase of nearly 22,000 tons compared with last year. The total exports of breadstuffs during August, 1890, reached a value of $10,000,840, against a total for August, 1889, of $13,362,776. The total for the eight months of the calendar year shows, however, a substantial increase. The cattle exports for August show a marked gain. The total beef and hog products exported show a slight gain for August of this year, the figures being $9,412,459, against $9,037,674 for August, 1889. The totals for ten months were $83,342,798 in 1889 and $97,791,446 in 1890. Dairy products alone show a marked falling off.

Metal Market.

Copper.—The leading Lake Superior producers accepted orders from consumers for supplies thought likely to be wanted up to the end of October, taking the same at 17¢ ℔ lb. Outside of this there were transactions involving 500,000 lb or more, chiefly at the same price. It is asserted that the largest producer had not completed all August deliveries at the middle of this month, and that the recent contracts will probably absorb the entire output to November 1. This and other circumstances reveal a very strong position, yet the controlling spirit in the market would appear opposed to the price going above 17¢, although refusing, it is said, to take orders for delivery further ahead than October. Owing to washouts at the mines, the Arizona producers refuse to sell Pig Copper for delivery ahead, and Arizona Ingot is firmer at 15½¢. Odd lots of Casting Copper probably could be picked up at 14½¢, but anything under 14⅝¢ @ 14¾¢ is purely exceptional. London prices have further advanced, and the position of the European as well as the home market is very strong. James Lewis & Co.'s Liverpool circular remarks that "furnace material has been more inquired for; 12/ ℔ unit has been paid for ordinary Anaconda Matte, while the value of the Argentiferous quality is only 11/9 ℔ unit, 25 ounces silver being now allowed free, instead of 30 ounces, as heretofore."

Pig Tin.—Prices have continued to move steadily upward, with the final result an advance of 0.60¢ on prompt and present month delivery and 0.30¢ on futures. The few dealers in whose hands the bulk of the spot supply is concentrated have been selling to the out of town trade at prices a round fraction below those officially quoted on the Exchange, but while reflecting rather sharp competition, that action has been instrumental in getting considerable Tin into the channels of consumption. Deliveries have, in fact, largely exceeded the importations, which fact, together with the moderate shipments from the Straits during the first half of the month, makes the statistical position even stronger than it was last week and more disagreeable to holders of "short" contracts. The shipments from the Straits were 675 tons to Great Britain and America and 200 tons to the Continent. It is estimated that unless some shipments are made hence from the Continent there will not be over 150 tons available for delivery on September contracts out of the quantity due to arrive during the balance of the month. The Continental dealers, it is stated, are watching the American market very closely. On Wednesday's market 22.80¢ net cash was bid for round lots for prompt delivery, yet offers at 22.85¢ found no takers, and quotations of 22.75¢ to out of town trade met with no response, although local jobbers asked 23¢ upward for small quantities. Up to 22.95¢ was bid on the Exchange for September. October delivery was offered at 22.45¢ and November at 22.40¢, against which bills of 22.85¢ were made.

Pig Lead.—Prices for this metal have gone another fraction higher and the indications are that the market is hitched, temporarily at least, at the 5¢ mark. A great deal, of course, depends upon the patience of the few large holders here, who are believed to control about 6000 tons. During the week 400 to 500 tons have been sold here at from 4.85¢ up to 4.97½¢, and for single carload lots 5¢ has been secured. The Western markets are, if anything, more buoyant than this, with 4.80¢ reported paid at St Louis for 1000 tons and 4.90¢ rumored bid subsequently.

Spelter.—Prices have hardened a trifle, but the demand has increased very little, if at all. October shipment is difficult to obtain at less than 5.55¢, and generally held at 5.60¢. For moderate quantities on the spot 5.65¢ upward is asked.

Antimony.—There has been very little change the past week. The current quotations are 20¢ for Hallett's, 22¢ for Cooksons and 20½¢ for LX brand.

Tin Plate.—During the early portion of the week under review several outside speculative lots were sold at very low prices, but the clearing up of those holdings placed the market in strong position and prices are very firm all along the line at this writing. Buyers are moving cautiously, however, and do not take futures with freedom, although cable advices quote the foreign market stronger. Quotations for large lines on the spot are as follows: Coke Tins—Penlan grade, IC, 14 x 20, $5.20 @ $5.25; J. B. grade, do., $5.25; Siemens Steel, ——; Bessemer do., $5.15 @ $5.20. Stamping Plates—Bessemer Steel, Coke finish, IC basis, $5.10; Siemens Steel, IC basis, $5.20; IX basis, $6.90. IC Charcoals—Calland grade, IX, $5.50; Melyn grade, $6; for each additional X add $1.50; Allaway grade, $5.25 @ $5.50; Grange grade, $5.50; for each additional X add $1. Charcoal Ternes—Worcester, 14 x 20, $5.25; 20 x 28, $10.25; M. F., 14 x 20, $7.50; do., 20 x 28, $17; Dean, 14 x 20, $4.75; do., 20 x 28, $9.75; D. R. D. grade, 14 x 20, $4.70; do., 20 x 28, $9.50; Mansel, 14 x 20, $4.65; do., 20 x 28, $9.50; Alyn, 14 x 20, $4.75; do., 20 x 28, $9.75; Dyffryn, 14 x 20, ——; do., 20 x 28, ——; Wasters—S. T. P. grade, 14 x 20, $4.45; do., 20 x 28, $9; Abercarne grade, 14 x 20, $4.40; do., 20 x 28, $8.75.

New York Metal Exchange.

The following sales are reported:

FRIDAY, September 12.

20 tons Tin, September..... 30.20¢

SATURDAY, September 13.

10 tons Tin, October..... 22.15¢
10 tons Tin, buyer's option, one week. 22.50¢

MONDAY, September 15.

10 tons Tin, September..... 22.80¢

Coal Market.

Accounts concur in representing that the tone of the Anthracite Coal market is much improved, and that prices are firmer. The change results more from uniformity in restricting the production and a more scrupulous regard for the adopted schedule than from the increase of new orders. For the week ending 6th inst. the decrease compared with the previous week was 170,000 tons and compared with the same week last year 88,834 tons, total 651,088 tons, and for year 22,587,000 tons. During the week the sales agents virtually agreed upon another advance, so it is reported, and at a meeting called for to-day further action may be taken. The proposed figures for Free Burning are: Broken, $3.90; Egg, $4.05 @ $4.15; Stove, $4.30 @ $4.40; Chestnut, $3.90 @ $4.40. This talk is expected to stimulate tardy buyers. Present prices are: Broken, $3.75; Egg, $3.90; Stove, $4.15; Chestnut, $3.75.

Philadelphia advices speak of large contracts for Furnace sizes for future delivery at prices now ruling, iron makers being heavy buyers. Reading tonnage for the week, 170,000 tons; Pennsylvania Railroad, 198,133 tons. Soft Coal output for the week, 221,899 tons.

An event in the Lehigh Valley during the week was the formal dedication of a massive new breaker and the opening of three large new mines, at Blackwood. Many officials were in attendance, who were received by W. A. Lathrop, the general manager; Calvin Pardee is the projector. The new railroad, 35 miles long, connects with the Valley Road at Schuylkill Junction. Broadtop tonnage for the week was 43,500 tons; increase for the year, 500,000 tons.

The Bituminous trade is quiet.

Imports.

Hardware, Machinery, &c.

Boker, Hermann & Co., Anvils, 118
Field, Alfred & Co., Mdse., cs., 42
Folsom Arms Co., H. & D., Arms, cs., 14
Graef Cutlery Company, Cutlery, cs., 6
Godfrey, Chas. J., Arms, cs., 14
Hartley & Graham, Arms., cs., 16
Johnson, John & Co, Mach'y, pkgs., 122
Jordan, A. J., Arms, cs., 16
Lau, J. H. & Co., Arms, cs., 23
Meacham Arms Co., Arms, cs., 19
Oertler, W. C., Mach'y, cs., 10
Schoverling, Daly & Gales, cs 33, Mdse., cs., 16
Sheldon, W. & Co., Mach'y, cs., 50
Taylor, Thos., Mdse., cs., 3
Vought & Williams, Anvils, 42
Ward, Jas. E. & Co., Mach'y, cs., 15
Werlemann, H., Arms, cs., 16; Mdse, cs., 22
Wiebusch & Hilger, Mdse., cs., 11; Anvils, 167
Wyman, C. H., Arms., cs., 7
Order—Mach'y, pkgs., 48

British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, WEDNESDAY, September 17, 1890.

In Pig Iron Warrants there has been a sharp rise all around. Scotch advanced 1/3 to 51/; Cleveland, 1/3½ to 47/10½, and Hematite, 1/10 to 58/3 during the week. Operations have been on a larger scale, and stimulated the prospect of a strike by furnace workers taking place nexth month. Reported scarcity of fuel and consequent increased cost of production also tend to promote speculation, while rapidly declining stocks and improvement in the trade demand serve to strengthen the position materially.

Copper advanced sharply early in the week, reaching £61. 12/6 under the influence of heavy outside buying. Some of the prominent "bulls" then sold freely, causing a reaction to £60. 17/6, but since the withdrawal of that pressure prices moved back to £61. 10/. The control of the market is in strong hands, and a still further rise in prices is considered likely.

Prices for Block Tin on the spot advanced to £99. 7/6, selling at a premium over futures. Supplies for near delivery are very scarce, and large purchases have been reported of calls at £100, extending over November. This movement is attributed to threatened small supplies. owing to the condition of the market for Silver, and threatened labor troubles. Available stocks are low and very firmly held for still higher prices.

On Tin Plates buyers and sellers are still wide apart, and both sides appear to prefer waiting. Makers are particularly slow to make engagements pending a final settlement of the American Tariff bill. Under the present state of affairs only nominal prices are quoted.

Steel Ship Plates are now quoted at £6. 10/ at Barrow, and Wire Rods are up 2/6, but on other forms of Steel there has been radical change. Advices from the Continental markets report a firmer feeling there on both Iron and Steel.

Scotch Pig Iron.—Business has been brisker and the market is firm, with prices higher for most brands.

No. 1 Coltness,	f.o.b. Glasgow	.....	64/
No. 1 Summerlee,	"	"	62/6
No. 1 Gartsherrie,	"	"	61/6
No. 1 Langloan,	"	"	64/
No. 1 Carnbroe,	"	"	52/6
No. 1 Shotts,	"	at Leith	63/6
No. 1 Glengarnock,	"	Ardrossan	60/6
No. 1 Dalmellington,	"	"	54/6
No. 1 Eglinton,	"	"	53/

Steamer freights, Glasgow to New York, 2/, nominal; Liverpool to New York, 7/6

Cleveland Pig.—Operations have been larger and the market is stronger. Makers brands sold at 47/3 @ 47/6 for No. 3 Middlesborough, f.o.b.

Bessemer Pig.—With warrants higher and the demand the market is very firm. West Coast brands, Nos. 1, 2 and 3, quoted 58/6, f.o.b. shipping port.

Spiegeleisen. — Prices are without change, but the market is firmer and fairly active. English 20 % quoted at 100/, f.o.b. shipping port.

Steel Rails.—Orders are unimportant and prices remain unchanged. Heavy sections quoted at £5 and light sections £5. 15/ @ £6, f.o.b. at N. W. England shipping point.

Steel Blooms.—The demand has continued moderate. Makers quote at £4.17/6 for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—There is a fair business, with prices steady. Bessemer, 2½ x 2½ inches, £5, f.o.b. at N. W. England shipping point.

Steel Slabs.—Prices remain as before and the market steady, with demand fair. Bessemer quoted at £5, f.o.b. at N. W. England shipping point.

Old Iron Rails.—There has been more inquiry and somewhat better prices are offered. Tees quoted at £3. 2/6 @ £3. 5/ and Double Heads £3. 5/ @ £3. 7/6, f.o.b.

Scrap Iron.—Prices are unchanged, but the demand is better and the market firmer. Heavy Wrought quoted at £2. 7/6, f.o.b.

Crop Ends.—More inquiry is noted and holders ask higher prices. Bessemer quoted at £3. 2/6 @ £3. 7/6, f.o.b.

Tin Plate.—Business is held in suspense and buyers and sellers are still apart on prices. We quote f.o.b. Liverpool:

IC Charcoal, Alloway grade	16/9 @ 17/0
IC Bessemer Steel, Coke finish	15/9 @ 16/0
IC Siemens " " "	16/0 @ 16/3
IC Coke, B. V. grade	15/6 @ 15/9
Charcoal Terne, Dean grade	14/9 @ 15/

Manufactured Iron.—There is a very fair busines, and, except for Welsh Bars, prices remain very steady. We quote, f.o.b. Liverpool:

	£	s.	d.		£	s.	d.
Staff. Marked Bars	.....			@	9	0	0
" Common "	....	7	2	6 @	7	5	0
Staff. Bl'k Sheet, singles	7	17	6	@	8	0	0
Welsh Bars (f.o.b. Wales)	6	5	0	@	6	7	6

Tin.—The position continues strong and prices show a further rise. Straits quoted at £99. 7/6 @ £99. 10/, spot, and £98. 10/ for three months futures.

Copper.—Demand is less active but the the market shows very firm undertone. Merchant Bars quoted at £61.5/, spot, and £61.12/6 three months futures. Best Selected, £67.10/.

Lead.—Prices have moved a shade higher and the demand is good. Quoted at £13. 12/6 @ £13. 15/ for Soft Spanish.

Spelter.—No further change in prices but the market firm. Quoted at £24. 10/ for Ordinary Silesian.

A press dispatch from Ashland, Wis., states that Wisconsin Central surveyors have completed a survey for a branch to tap the new iron range known as the Messembriar. The track will be laid early next spring.

The Amalgamated Association of Iron and Steel Workers, with headquarters at Pittsburgh, have decided to print their constitution in the French, Swedish, Hungarian and Polish languages, for the benefit of members of those nationalities. The Amalgamated Association takes the lead in this movement, no other association ever having gone to this expense before.

A bill to forfeit the charters of companies comprising the Chicago Gas Trust has been filed on behalf of the city of Chicago in the Circuit Court. The charge is that certain gas companies named have combined to suppress competition and create a monopoly, with the result that the city and individual consumers are charged exorbitant rates for the gas.

Grand Master Sweeny, of the Switchmen's Association, addressed the annual convention at Buffalo, and explained the objects of the organization, one of which was "to prevent strikes and trouble." "The better the organization of a trade," he said, "the less need there will be of a strike."

Marquette, Mich., in addition to her iron mines, expects to become famous for her Ishpeming marbles, claimed to compare with the Mexican onyx.

The Crane Iron Company, of Catasauqua, Pa., are building a modern 18 x 75 foot blast furnace equipped with fire brick stoves. Their old B furnace is torn down to make room for the new plant. Frank C. Roberts, C. E., Philadelphia and Pittsburgh, the engineer of the company, will prepare all plans and specifications for the plant.

It is stated with the appearance of authority that the contract with the Cataract Construction Company for the great water power tunnel at Niagara Falls has been taken by Rogers & Clement, of New York. The cost of the work is said to be up in the millions, as the tunnel will exceed 1½ miles in length, passing directly under the village of Niagara Falls. Some of the New York Central Railroad directors are understood to have purchased the franchise.

In a letter to the Collector of Customs at New York, the Treasury Department has made the following decision: On nails manufactured by the Brooklyn Wire Nail Company, of Brooklyn, N. Y., from imported steel rods, used in the manufacture of wooden cases made wholly from imported materials, and exported as coverings for petroleum in 5 gallon tin cans, drawback will be allowed equal to the duty paid on the imported rods used in the manufacture of such nails, less the legal retention of 10 per centum. The quantity of the rods so used will be determined by adding to the allowance of 11.45 pounds per 100 cases, specified in synopsis 7702, 7 per cent. of such allowance.

The task of reforming the Argentine Government has commenced under great difficulties, and it remains to be seen what the retirement of President Celman and the organization of a new administration will accomplish, but hopes are entertained that a policy of economy and integrity will bring order out of confusion. A correspondent at Rio says: "The difficulty is how to deal with the currency problem. Undoubtedly the foreign bankers, who are so deeply involved, will do all they can to extricate the Government from its difficulties, but will investors in Europe follow them? Will it be safe for investors to trust them again? Is there any dependence to be placed in the Argentine Government when it is reformed?" The Argentine has not the advantages of Brazil with products which no other part of the world can compete with in quantity, quality and cost of production. It has not vast mineral wealth, and its development for a long time to come must be limited to its agricultural and pastoral industries. With the utmost economy and perfect honesty in administration, it is exceedingly doubtful whether the liabilities of the Government can be met for awhile. Probably the creditors will have to yield 1 or 2 per cent. of their interest for a year or two, but in the end they will get all that is due them.

HARDWARE.

Condition of Trade.

The reports which are given below give, it will be observed, a very satisfactory impression in regard to the condition of business throughout the country, as our correspondents almost uniformly refer to its large volume of trade and the excellent tone of the market. Since our last review there have been but few and unimportant changes in price. Manufacturers, as a rule, are full of orders, and in several lines there is considerable difficulty in obtaining goods with sufficient promptness to meet the demands of business. In spite of the financial stringency there is not as much complaint in regard to collections as might have been expected.

Chicago.

(*By Telegraph.*)

Hardware.—Jobbers are very busy and trade is increasing, as is usual in September. The freezing weather in Minnesota and North Dakota last week seems to have had but little effect here in hastening purchases of winter supplies. Heavy Hardware is slackening its pace, some houses reporting business rather quiet in comparison with their recent experience. No special changes in prices are reported.

Nails.—Manufacturers' prices are weaker, especially for Cut Steel. They quote on basis of $1.80 @ $1.85, Wheeling, but, in some instances have shaded this figure. It is apparent that the demand for Cut Nails is becoming more and more restricted. Jobbers say that while they do not hesitate to order Wire Nails freely as their stocks are reduced, they make an order for Cut Nails the subject of very careful consideration. Still Cut Nails have not entirely gone out of fashion, and inquiries for some large lots are now in the market. Wire Nails are reported by manufacturers to be in good demand, and they have recently booked heavy orders, but the business has not been large enough to go round, and some weakness is manifested. The usual quotation is $2.55, Chicago, from factory. Jobbers are selling a great many Nails, but have also eased their prices slightly, and now quote $2 @ $2.05 for Cut Steel and $2.60 @ $2.65 for Wire, with 5¢ off for carloads.

Barb Wire is in fair demand, with orders on the increase. Some disturbance has been created by the appearance in a few Western localities of a far Eastern competitor, but in this market quotations are unchanged at 2.9¢ for Painted and 3.5¢ for Galvanized.

St. Louis.

Jobbers report an increasing demand for all lines of seasonable goods. Traveling men are sending in very satisfactory orders and anticipate a steady trade during the balance of the year. Shelf Hardware is in active demand. Wire Nails, Cut Nails and building material of every description are included in every order now being received by the jobbers. Barb Wire is moving quite freely, but this commodity suffers somewhat in price as jobbers will occasionally sell for cost, thus securing a large order for Hardware, making up the loss on the Barb Wire out of the Hardware bill. Local retailers report an excellent business. Prices are firmly maintained, and it is only occasionally that complaints are heard in this direction.

Cleveland.

The W. Bingham Company.—Since our last, in your issue of the 4th, the fall trade has commenced in earnest. The large trade in July and August led us to be a little apprehensive for the future. Our fears have thus far been without realization, as so far the trade for September has kept pace with the preceding months. In fact, in many lines it seems almost impossible to get orders filled at all. The sheet iron mills are notably behind, the manufacturers of galvanized iron being particularly so, but as yet it has had no effect upon the price. When the change comes it must be in the way of advances. Orders for Nails are numerous at $2.60 for Wire and $2 for Cut, from stock. Barbed Wire sales are about the average for this season, Painted quoted at $2.95 and Galvanized at $3.45 for ordinary lots. Retailers in this city all report a good average business. Those who deal in furnaces and stove work are very busy. Builders' Hardware is still in large demand. Collections are fair, the money market somewhat tighter than it has been. The railroads centering here are all crowded with freight, one line having an accumulation of loaded cars on its tracks which have been waiting on an average for four days before they could be unloaded.

Louisville.

W. B. Belknap & Co.—Business conditions are somewhat mixed and are rather interesting to any student of commerce and finance. The rolling mills seem never to have overtaken the time lost by the summer's heat. The temperature, which in old times would have occasioned little or no inconvenience, is now made a ground for non-delivery of material. As we said once before, this indicates a much more independent position of the workman and leads us to believe that the wages paid are such as to enable him to provide as well against a hot day as against a rainy one. It is pleasant to think that this is the case, and we should congratulate ourselves on it rather than permit any impatience or temporary disappointment to disturb us. One of the manufacturers of specialties in iron wrote us a day or two since that he did not see why there was not a boom; he never found it harder to get iron. One good reason for there being no boom is the tightness of the money market—all available funds are used up. We know of one case where an individual in perfectly good credit, with ample security, or what would have seemed ample a short time since, offered 1 per cent. per month for the loan of $10,000 for 60 days, which tempting offer was declined for want of funds. Good rains have opened up the Ohio River to Pittsburgh, and we shall doubtless see some relief to the congested railroads centering there and at Wheeling. In our last letter we had occasion to refer to the obnoxious new bill of lading. We see that the Lake Shore has thrown it over, and Commissioner Blanchard has admitted that he is beaten in the fight. It might as well be admitted that there are two sides where there are two parties in interest, and when the Freight Commissioners or Car Service Association draw the line too tightly, it is bound to snap. The limit of elasticity is a well recognized condition in the physical world, and should not be ignored by those in the business world who go about making rules for others to follow.

Boston.

Bigelow & Dowse.—September is the commencement of the fall trade in New England, and thus far the sales have been very satisfactory. Customers are buying freely and the orders are well assorted, which indicates that the retailers' stocks are light. The indications now are for a large volume of business this fall. The price of Wire Nails is irregular. The agents of Western mills hold their price at $2.75 for Nails from store. The jobbers are underselling this price and will continue to do so as long as they can supply their wants from Eastern mills, which have the advantage now, since the recent advance in freight from the West. The price of Steel Cut Nails is unchanged, but notwithstanding the higher price of Wire their sale is increasing, while the sale of Steel remains about the same. Some jobbers are underselling the factory price on Disston's Saws, which we understand is contrary to the wishes and positive instructions from the factory. Where a few show this disposition to throw away a profit there should be some way to protect those who are willing to carry out the wishes of the manufacturer.

St. Paul.

Farwell, Ozmun, Kirk & Co.—We have just got through with a week of State Fair, which is held on the large and beautifully arranged grounds of the State Fair Association, located midway between the Twin Cities. Owing to the attractions offered and cheap rates made on all railroads the crowd this year was unusually large, and nearly all of the country merchants within a radius of several hundred miles have been in town, making business very lively. There seems to be a pretty good feeling among all those we have talked with regarding the outlook for fall trade. In nearly every section tributary to us the crop is fully up to the average and the prices that farmers are realizing very satisfactory. The wholesale trade in all lines is beginning to feel the effects of this pleasant state of things. There is nothing

of special interest pertaining to the Hardware trade to note at this time. Prices of all seasonable goods are well maintained.

Omaha.

LEE-CLARKE-ANDREESEN HARDWARE COMPANY.—The past two weeks have developed nothing particularly exciting or new. No marked changes have occurred, the general situation remaining in much the same condition as noted in our last report. Mail orders continue to come forward in a steady flow, and although not usually large, the aggregate is quite satisfactory. Travelers are sending in fair orders, both in numbers and size. Retailers, as a rule, are not anticipating their requirements to any extent, the markets offering no special inducements to anticipate their wants by early buying. A pleasant feature to note is that the Eastern money markets are reported as much easier, and a decided improvement from the stringent condition of two weeks since, especially now when the usual increased demand for money attendant on fall trade and unmarketed crops is such a heavy factor in straining the resources of financial centers. Owing to tariff legislation, Tin Plate, Guns, Stamped Tinware, &c., have had to be marked up to correspond to advices received from the sources of supply. City trade still keeps up its accustomed activity. Numerous public and private enterprises are being pushed rapidly forward to completion, and despite the chagrin of inferior cities hereabouts, there is no doubt but what Omaha is destined to retain her present enviable position as the largest and most populous city on the Missouri River.

Portland, Ore.

FOSTER & ROBERTSON.—A more perfect state of affairs than exists in the Pacific Northwest to-day could not well be imagined. An unusual acreage, a large yield of very perfect grain, an active demand and liberal prices for the same, are conditions that surround the farmers of this section this fall. The fact that a goodly portion of the incoming large and profitable crop is needed to pay up the indebtedness of past years will act as a fortunate safety valve against speculative tendencies, which are so liable to manifest themselves in a new country, Trade for some weeks has been moving along in a steady yet active manner. Since the issuing of our new catalogue, which has been warmly welcomed and highly complimented by the entire coast trade, mail orders have greatly increased in number and value, while orders from travelers are numerous, of fair size and nicely assorted, indicating that merchants are buying to supply felt wants. With three or four new railroad lines building out of Portland, it naturally follows that there should be an active demand for tools and materials that are used in bridge building and for other construction purposes. Logging and lumbering interests are quite fairly active, although prices are low, and in consequence the demand for Crosscut Saws, Axes, Peaveys, &c., is liberal. As fall approaches, the finishing up of buildings begun earlier in the spring naturally leads to great activity in Builders' Hardware, the trade in which is much better at the present than at any other time this season. The re-enumeration of our city, which has been going on for the last ten days or two weeks, and which has been watched with no small amount of interest, is now just completed, and gives to our city a population of about 69,000, or a gain of nearly 24 per cent. over the slipshod, indolent and imperfect enumeration of last June. This manifestation of progress cannot but have an inspiring effect upon the people of Portland and vicinity, and this revelation of slovenliness, negligence, indolence and incapacity, which is without parallel in the history of the work done under the Census Bureau, ought to lead to a recount of the entire State, and this recount, if taken, will put new life and vitality into what has been heretofore a very conservative and slow moving State.

San Francisco.

HUNTINGTON-HOPKINS COMPANY.—Our budget this week will not vary from our last report in particular, with the exception that, at the time of writing, trade is not as brisk as we had good reason to expect it would be. We can account for this in only one way: The 9th inst. being the fortieth anniversary of the admission of California into the Union, the major part of the State, led by the society of "California Pioneers and Native Sons of the Golden West," are indulging in a vast holiday, covering a period of five days. The city is full of visitors from the interior, but we assume they have neglected their business to a slight extent, making preparations for this event; the result has been that trade has somewhat suffered. We trust this will be offset by a reaction immediately after the holiday. We then will look for very lively times. Prices in all lines, including Shelf Hardware and Heavy Hardware, Plumbing Material, Iron, Brass Goods, &c., are all firm, with somewhat of an upward tendency.

Baltimore.

CARLIN & FULTON.—Trade continues active, though shipments to the cotton States will soon diminish with the advancing season.

It is to be hoped that the stringency in the money market may not seriously affect the interior towns, as the money is now needed to move the crops. The scarcity of ready cash with the average planter will possibly for the present remove the antagonism of the Farmers' Alliance to the retail store keepers, whose profits have very largely been based upon extended credits, and whose prices would no doubt be largely reduced to "cash" buyers. A great relief to the country at large will be when the Conference Committee on the Tariff bill ends its labors and announces its results, and it will be a great regret if the enforced speedy withdrawal of goods now in bond increases the present high rates for money and precipitates what all parties must deplore, a panic in finances.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—Trade continues without any material change since our former correspondence. The greater variety of goods called for is very noticeable in all departments. Shelf Hardware, in its endless variety, and in fair to large quantities, is embraced in orders being received, and perhaps at no time during the last two years has the demand been so scattered over so great a variety of goods. In these there is no indication of a speculative demand for limited lines of goods, as was the case one year ago, while the orders in their variety foot up equally large, if not larger, than any one year at this writing. If we may judge from our own experience, would say the sales on Meat Cutters within the last month have been unprecedented for this early in the season, and the demand for Building Hardware has been far above the average. This, however, is but what was naturally looked for by those who had familiarized themselves with the improvements in building operations and had regulated their stocks accordingly, Building Hardware being the last article required to finish operations.

As a rule, the demand in this line has been for the better grade of goods. The retail Hardwareman always has an abundance of the cheap Rim and Mortise Locks on his shelves, bought from various salesmen, who throw them out as a leader at about actual cost or less than cost of production.

Owing to the proposed change of the Tariff on Cutlery, which is likely to go into effect at an early date, prices on Wostenholm Cutlery have advanced to somewhere near what the new importation cost will be in the near future. The stocks of Wostenholm Cutlery in the hands of the largest importers in the country, which by the way can be counted by the thumb and fingers on one hand, is not large, and the uninformed will scarcely believe what is our experience, that Wostenholm has unfilled orders of certain numbers taken as far back as February last, and large unfilled orders of ordinary styles taken as far back as May last, none of which will be likely to arrive before the change in the Tariff has taken effect.

These goods, notwithstanding the care and attention required to keep one's stock in a condition to fill the great variety of numbers, have been sold at a ridiculously low margin of profit. A Pocket Knife costing, say, $4 has been sold for about $4.25, and recently at about $4.40. The proposed Tariff on this grade of Knife will come under the $2 per dozen advance, hence, with the additional extra expense, as at present construed, will make the Knife cost over $6.

The advance on Pocket Knives costing over $12 per dozen, the percentage of advance will not be nearly so great, but the present advance made by the trade in our city does not represent what the actual cost will be on receipts after the new Tariff law is in operation, but customers will have Wostenholm Pocket Knives; buyers

may hold off for a short time, but a still further advance must take place, and their customers will continue to call for them and will have them at any reasonable price.

The stringency in the money market has had a marked effect on local collections. It is well known that the greatest stringency has taken place in the Eastern cities, especially New York and Philadelphia, from where all available funds have been sent to the West and South for moving the crops. While money is fairly plenty in those two sections, nothing on fall purchases, of course, is due merchants.

The disbursement by the Secretary of the Treasury of the United States has failed to relieve the stringency, which is quite natural, as the holders of Government bonds in large blocks are not persons who are in need of cash, and are not merchants or even speculators usually (certainly not Hardwaremen), but parties of wealth who carry these bonds for investment, granting the greatest amount of security, who only require their interest as an income. That class of persons will hold their bonds unless the temptation is very great to sell, and in that case will reinvest in other bonds or securities, and but little of the funds go into the national banks to reach the merchants, manufacturers, builders or mechanics.

Barb Wire.

There has been no important change in the market since our last review, and quotations are on a basis of $3.30 to $3.35 for Four-Point Galvanized in good lots at mill, with the usual reduction for Painted Wire. The volume of business is fair, but not especially heavy.

Wire Nails.

There has been, perhaps, a slight falling off in the demand, but the volume of business continues good and prices are steadily maintained. There is some difference between the quotations made by the mills, but in a general way $2.40 to $2.50 may be given as the quotation for carload lots at factory. Some of the jobbing houses are disposed to shade slightly their prices for small lots from store, and $2.65 to $2.75 is about the ruling price.

Cut Nails.

On Thursday a meeting was held by Eastern Cut Nail Manufacturers, at which 18 mills were represented. After a full discussion of the situation it was decided to adhere for a period of 30 days to the following quotations on Iron Cut Nails: $1.90 on dock for carload lots and $2 from store. Agents have already sent out circulars to this effect. The action of the Nail makers seems to have been the outgrowth of a feeling that matters could not continue as they have in the past, the prices to which Nails have been forced by reckless competition on the part of a few being ruinous. What gives strength to the movement is that quite a number of the Nail mills have found it more profitable for the last two or three months to sell Muck bar.

How does The Iron Age help you in your business?

COMPETITION NO. 5.

The Use of The Iron Age in Hardware Stores.

We are desirous of hearing from the trade on this practical question: The usefulness of *The Iron Age* in Hardware Stores. Thousands of Hardwaremen find the paper a very great assistance in their business, and the object of this competition is to draw out brief, practical statements of the ways in which it is of service to them, whether in its

Hardware Trade Report,
Discussion of Trade Topics,
Editorials,
Descriptions of New Goods,
Articles on Business Methods,
Descriptions of Hardware Stores,
Advertisements, { which embody such a mass of valuable information
Items in regard to Manufacturers,
Review of the Iron and Metal Markets,
Descriptions of Machinery,
Record of Mechanical Progress,
Metallurgical Information, &c.

The prizes announced in connection with this competition are as follows:

FIRST PRIZE, - $100.
SECOND PRIZE, - 50.

It is possible that some brief, pointed, business-like statements of the use made of *The Iron Age* will be regarded by the Committe of Award as better than some long and elaborate essays, and as entitled to a prize.

But we venture to specially request that Hardwaremen without regard to the winning of a prize will write us in answer to this question, In what ways is *The Iron Age* of use to you?

At the same time we should value suggestions as to how we can make it still more useful. If it lacks anything in its Hardware department, be kind enough to tell us what it is.

We shall hope to hear from many of our friends on this subject.

It will be remembered that this competition remains open only until the close of business September 30.

Contributions should be addressed to *The Iron Age*, 66 and 68 Duane street, New York, and marked Prize Competition No. 5.

Miscellaneous Prices.

The firmness in the Shot market to which we have before referred has developed into a further advance. Under date September 12 the following revised prices are announced, subject to a discount of 2 cents per bag of 25 pounds, if paid within 5 days from receipt of bill:

Drop Shot, per 25-pound bag	$1.45
Drop Shot, per 5-pound bag	.34
Buck and Chilled, per 25-pound bag	1.70
Buck and Chilled, per 5-pound bag	.39
Dust Shot, per bag	2.00

The condition of the Hardware market abroad, as well as the prospective passage of the revised tariff, continues to exert considerable influence on the prices of many leading imported goods and higher quotations are being named. Within a short time advances have been announced in both Wilkinson's and Ward & Payne's Sheep Shears, and slight advances have been made in Grass Hooks. Pocket Cutlery has also still further advanced, a line on which the new tariff will have a marked effect, and on the other side the cost of production, owing to advance in wages, has been materially increased. In this connection the remarks of Supplee Hardware Company, who are large importers, in their report on a preceding page, are deserving of attention. As noted in our last issue, John Wilson's Butcher Knives and Steels, Guns and other Hardware are held at increased prices, and it is not unlikely that there will be still further advances if, as is generally expected, the new duties should go into effect, as the importers have not in all cases advanced goods to figures which will be necessary under the proposed tariff. There is, of course, some uncertainty in regard to the course of prices abroad. Some well-informed parties are under the impression that the limit of high price has been about reached and that declines are likely to occur before long. There are, however, others who see no indication of this and look for the maintenance at least of present prices, with some possibility of further advances.

The Tackle Block market continues in the demoralized state to which we referred in our last issue. Very low prices are being made, without indications of action on the part of the manufacturers looking to a cessation of their animated competition.

The Sandpaper market is referred to by some as slightly improved, but it would appear that there has been no material change in price. The quotations of the different manufacturers are somewhat wide apart, and there is considerable divergence between prices paid for the most approved brands and those at which less favorably known goods can be purchased.

There is no quotable change in Screws, but our advices indicate that there is an increasing number in the trade who, from manufacturers or jobbers, are able to purchase goods at concessions from prices which are regularly made to retailers. Thus, 50 and 10 or 50 and 10 and 5 per cent. discount, with delivery, is frequently obtained by retail merchants whose orders call for a fair quantity of goods.

The Alford & Berkele Company, 77 Chambers street, New York, issue a circular relating to Electric Hammerless Automatic Revolvers, 32 caliber, central fire, full nickel plated, rubber stock, automatic shell ejector, self cocking. They are quoted at $6 net.

Loring & Parks, Plymouth, Mass., issue a card relating to Mayflower Steel Carpet Tacks, one of their latest specialties. These goods are packed 72 papers in a box, and warranted 250 Tacks to a paper. Each box contains the following assortment:

6 papers, 6 ounces, Black.
18 papers, 8 ounces, Black.
12 papers, 10 ounces, Black.
6 papers, 6 ounces, Tinned.
18 papers, 8 ounces, Tinned.
12 papers, 10 ounces, Tinned.

These goods are sold, if packed as per above assortment, at $1.40 per box, or, if packed all black, at $1.10 per box, subject in either case to a discount of 2 per cent.

Maryland Tack Company, Baltimore, Md., issue a circular relating to their Monumental Steel Carpet Tacks, and call special attention to the method in which they are put up, in five different sizes of uniform weights of 1, 2, 3, 4 and 5-ounce papers, Blued, Bright, Polished and Tinned. The following price-list indicates their assortment, and is subject to a discount of 30 per cent.:

Box A	contains	144	1-oz.	papers,	Blued	$1.24
" B	"	" 2	"	"	"	2.20
" C	"	" 3	"	"	"	3.10
" D	"	" 4	"	"	"	4.00
" E	"	" 1	"	"	Tinned	1.40
" F	"	" 2	"	"	"	2.50
" G	"	" 3	"	"	"	3.60
" H	"	" 4	"	"	"	4.65
" J	"	100 5	"	"	Blued	3.60
" K	"	" 5	"	"	Tinned	4.10

Bright and Polished are the same prices as Blued.

The boxes containing 144 papers have 24 papers 6-ounce, 60 papers 8-ounce, 36 papers 10-ounce and 24 papers 12-ounce Tacks, or will be put up to suit the trade. The Jumbo Package (100 5-ounce papers) contains 15 papers 6-ounce, 45 papers 8-ounce, 25 papers 10-ounce and 15 papers 12-ounce Tacks, or will be put up to suit the trade.

Reports have recently been in circulation in regard to a Window Glass combination with a view to control the manufacture and sale of Window Glass throughout the country. As usual in such cases, the reports are full of inaccuracies and very much exaggerated, whatever basis there may be for them in fact. It is true that negotiations have been under way for about two months with a view to the forming of a combination for the more satisfactory carrying on of the sale and manufacture of Glass, and to prevent the ruinous cutting in prices which has characterized the Glass market for some time, and at a recent meeting it looked as if the project might be successfully carried into effect. The effort has been made to have all the manufacturers in this country unite in this action, but this has not thus far been found feasible, and it is not unlikely that this fact may interfere with the carrying out of the project, though it is not impossible that an association may be formed, principally of the Western makers, which will have the effect of improving to a certain extent the condition of the market. An important meeting is to be held the present week, when it is thought likely that the matter will be settled one way or the other. A feature of the plan which has been proposed is that Glass made by the several factories should be sold through the central agency of the company, whose business shall be limited to carload lots, buyers of smaller lots being obliged to go to the jobbers. It has also been proposed that the boxes hereafter contain 100 feet instead of 50, as at present, as by doubling the capacity of each box lumber and handling expenses will be reduced something like 40 per cent. While it is reported that the united Glass companies of New York have given their adhesion to this plan, there is doubtless a serious obstacle to its success in the fact that the Glass factories of the Eastern district are not included, and that they will be in the market as serious competitors if the combination is formed as proposed. In this condition of things the market is naturally unsettled awaiting a conclusion of the negotiations.

The Wire Goods Company, Worcester, Mass., issue a discount sheet, No. 5, September, 1890, to apply to their catalogue of December, 1888. It supersedes their former issues.

Obituary.

For some months it has been known that Hermann Funke, senior member of the firm of Hermann Boker & Co., 101 Duane street, New York, has been in failing health, and his friends were therefore in a measure prepared for the intelligence of his death, which occurred last Monday. The recent death of his son, Hermann Funke, Jr., was a severe blow to him, and though borne with characteristic fortitude, doubtless in some measure hastened his death. His funeral was largely attended on Wednesday, at his late residence, College Point, L. I. In a later issue we shall refer at more length to his business career and his long connection with the Hardware trade, in which, for more than 40 years, he occupied a prominent place. Much sympathy is expressed for the firm of Hermann Boker & Co., in view of this bereavement, which takes from them one identified with the past history of the house, following as it does so closely upon the death of his son, whose future was so full of promise.

Items.

Auburn Mfg. Company, Auburn, N. Y., have issued, under date September 1, a circular relating to the marketing of their goods. They also intimate that their new illustrated catalogue now in the hands of the printer will soon be distributed. From their circular we make the following extract:

Obedient to a long settled conviction of expediency, we have assumed the direct representation and sale of our product of Agricultural Hand Implements to the Hardware trade throughout the country.

We believe our mutual relations and interests can be better promoted and subserved by a more intimate personal acquaintance than is practicable through the intervention of an agency.

If you share our views we bespeak your co-operation in making the plan effective. Our "direct representative" will call upon you at an early date, and should you desire our quotations previous to his arrival, we invite your correspondence.

We were never better equipped to serve our patrons. We have one of the largest and most complete factories to be found anywhere, an unusually large and fine stock of Handles and other materials, have introduced fuel oil and new machinery, and in a word are abreast of the times in all respects, and confident of our ability to please.

The condition of the Hardware trade at New Orleans during the past year is reported as having been very satisfactory. The shipping advantages possessed by the city have done much to secure a large import and export business that formerly found its way through other channels. Another interesting feature is the rapid development of the South in manufacturing and industrial interests, causing an increased demand for mechanical Tools, Builders' Hardware and Agricultural Implements. The fall trade, which commenced in July, has thus far been in excess of previous years, with excellent prospects for a heavy trade during the remainder of the year. Collections are reported fair, and with good crop prospects indications point toward continued and enlarged prosperity.

Puget Sound Hardware Company, Tacoma, Wash., report for the past month a steady increase in the volume of business, with indications of an active and prosperous trade for the balance of the year. Prices are referred to as firm and likely to be maintained for the remainder of the season. This firm was organized in May, 1889, and commenced business in July of that year, and has been doing, we understand, a very satifsfactory trade.

The trade will observe on page 61 the announcement of Brittan, Graham & Mathes, Pittsburgh, Pa., for whom Brittan & Bond are agents, 154 Lake street, Chicago. In it they call attention to their extensive assortment of Builders' Hardware, including a large and varied line of Locks, &c., and allude to the fact that they are prepared to make fine Castings in Iron, Brass and Bronze, and to do plating in Bronze, Nickel, &c.

Frank D. Moffat & Co., 81 Fulton street, New York, have been appointed sole Eastern agents for the Forsyth Scale Company, Youngstown, Ohio. A convenient catalogue and price-list is issued, illustrating their line of goods, consisting of Even Balance Scales, Butter Scales, Union or Family Scales, Standard Counter and Portable Scales, Platform Scales, Scales for Fish, Dairies and Rolling Mills; also Hopper Scales for Grain, Stock and Hay Scales, Graduated Pendulums and Compound Beams. They also show Letter Presses and Warehouse Trucks.

E. C. Stearns & Co., Syracuse, N. Y., manufacturers of Hardware specialties, send us an envelope such as they are sending to jobbers handling the Star Thimble. The peculiarity of the envelope is in having the words "Do You Sell the Star Thimble? It's the Best," printed on the flap. This use of the flap is referred to as being new in Hardware advertising.

The La Belle Cutlery Works, Smith Bros., proprietors, Bridgeport, Conn., advise us that they are running experimentally on a small line of specialties, consisting of Pocket Knives, made in cocoa, ebony and stag handle, either iron or brass lined. This line includes both one and two bladed Knives.

Haydock & Bissell, 12 Murray street and 15 Park Place, New York, announce in the special notice on page 57 a trade sale of Table and Pocket Cutlery, Butcher Knives, &c., on Thursday and Friday, September 25 and 26. A large assortment of these goods will be offered for sale, as well as a desirable line of Nickel Plated Scissors and Shears, Razors, &c. The goods are direct from the manufacturers and will be sold in quantities to suit the trade without reserve.

The Buffalo Forge Company, Buffalo, N. Y., manufacturers of Forges, Blowers, Exhausters, Punches, Shears and Drilling Machines, Patent Steam Hot Blast Heaters, Ventilating Wheels and Engines, advise us that their business has extended so far that in order to meet the demands of the trade it has been necessary to open branch offices at 704 Arch street, Philadelphia, and 16 South Canal street, Chicago, in addition to their regular offices in other cities.

A correspondent refers in the following terms to the practice of sending receipts on postal cards:

There is one nuisance that ought to be discarded, though still clung to by some good firms. I refer to open receipts on postal cards. They are too public, and are inconvenient for filing.

J. P. Sweney & Co., 620 North Main street, St. Louis, Mo., have been appointed sole agents for the city of St. Louis for the Berger Mfg. Company, of Canton, Ohio. Catalogues distributed by Sweney & Co. illustrate and describe at length Berger's Patent Eave Troughs, Hangers, Corrugated and Plain Conductor Pipes, Ridge Cappings, Steel Roofing, Corrugated Iron Siding, Ceiling and Shutters, &c., made by the Berger Mfg. Company. In addition to the illustrations and descriptions of the goods price-lists are presented.

The Chicago Axe Company, incorporated some months since, have purchased the factory near Hammond, Ind., built by M. M. Towle for the Chicago Safe and Lock Company, but for some reason not occupied by them. The Chicago Axe Company, it is reported, have paid but $40,000 for the plant, and have secured most admirable quarters for their new enterprise. They will employ from 150 to 250 men.

The Metal Edge Box System, controlled by the National Metal Edge Box Company, Philadelphia, is said to be meeting with great success. Individual concerns seem to appreciate this method of manufacturing their own boxes, judging from the patronage the company is receiving. The plan that the company adopt is to furnish consumers with boxes all cut, scored and cornered ready to put together, whereby a heavy stock can be stored in the flat, requiring very little room, and then readily converted on the premises into boxes with the metal edge, by a machine supplied by the company. It is claimed that a saving in cost is effected, and all delays avoided by loss in time in getting boxes by the old method. This system of box making is protected by 98 patents granted and others pending in various countries.

An editorial representative of *The Iron Age* found time during a brief visit to St. Louis last week to drop into the famous Cutlery establishment of A. J. Jordan. This is now generally conceded to be the largest exclusively Cutlery house in this country. Mr. Jordan occupies a large five story building at 612 Washington avenue, in the heart of the business section of the city, and has it stocked to overflowing with Cutlery of all kinds and grades. He makes a specialty of fine goods, however, having his own factory in Sheffield, England, turning out Cutlery with the now well known brand "AAA1." A stroll through the showroom on the first floor is a revelation of the possibilities of artistic workmanship in the manufacture of Cutlery and of cabinets to contain it. Carving sets are exhibited which are worth an average workman's month's wages. Cases of Scissors and sewing outfits for ladies are shown which are still more costly. The cases are made of pearl and the implements contained in them are decorated with gold handles, &c. Pocket Knives require for their display a large number of show cases. Mr. Jordan is at present in Europe, but will return home in November or December, his future movements depending to some extent on the duties on Cutlery which will be imposed by the new Tariff bill. If duties are increased, as at present seems highly probable, it may be necessary to rearrange some details of his manufacturing business. It will require very thorough investigation to decide what lines it will be most expedient to manufacture in this country.

The Ludlow-Saylor Wire Company, of St. Louis, state that their trade in August was heavier than that of any previous month in the history of the house. September, however, has thus far shown an increase over the corresponding period in August, so that the volume of business is increasing rather than diminishing. They make the important statement also that they have observed no tendency among their customers to make speculative purchases. The goods ordered are needed for current wants. Some of their largest customers, who should buy in carload quantities, have for a considerable time pursued the policy of taking small lots, but their very frequent orders have aggregated more than previous seasons. Fear of drouth affecting crops was the special cause for such conservatism, but fortunately a very large part of the territory tributary to St. Louis received sufficient moisture from time to time and a crop failure was thus averted though almost constantly threatened throughout the entire season. This was the cause of the conservative character of orders, and also the cause of the large aggregate to which they attained.

Price-Lists, Circulars, &c.

Fayette R. Plumb, Philadelphia, Pa., manufacturer of Hammers, Edge Tools, Sledges, Blacksmiths', Miners' and Railroad Track Tools, &c., has issued an edition of his catalogue containing supplements to date. Supplement No. 1, relating to Picks, Mattocks, Grub Hoes, Pick Eyes, Striking Hammers, &c., we have already noticed. Supplement No. 2 contains new goods which have been added to the line during the past season, consisting of Belgium Pavers' Hammers, Cobble Pavers' Hammers, Underhill pattern Lathing Hatchets, Mason's Reels, Plugs and Feathers, Wedges; also Contractors' and Ore Picks and Light Mattocks, which were overlooked when compiling Supplement No. 1 The supplements are printed in the same elegant and artistic style as the 1888 catalogue.

The Midgley Wire Belt Company, Beaver Falls, Pa., manufacturers of Plain Linked Wire Belt, issue a descriptive circular and price-list illustrating this Belt. The Belt weighs 1½ pounds per square foot, and a test made with the U. S. Testing Machine at Watertown Arsenal, Mass., fractured at one edge at 23,000 pounds strain, and elongated $1\frac{60}{105}$ inches in 5 feet. This Belt is also made with rubber filling.

The Oliver & Roberts Wire Company, Pittsburgh, Pa., issue a circular announcing their ability to furnish "The Best" Wire Box Strap in any quantity and upon short notice. They have recently purchased the patents and machinery formerly owned by the Corrugated Steel Box Band Company, of New York. "The Best"

Strap is referred to as being very strong and very light, and nails can be driven anywhere at the will of the packer.

Merwin, Hurlbert & Co., 26 West Twenty-third street, New York, issue a large and elegantly arranged catalogue, known as 5R, illustrating and giving prices of the extensive line of Sporting and Athletic Goods handled by them. It contains nearly 200 pages, which are divided into departments as follows: Photographic, Boat, Athletic and Gymnasium, Cycle, Saddle, Baseball, Gun, Cutlery, &c. Interspersed among the departments, and referring directly to each, are given appropriate pictures, for which *Outing* has largely been drawn upon. The catalogue will be prized, not only as complete in these lines of goods, but also as artistic.

Van Wagoner & Williams Company, 82 Beekman street, New York, issue a condensed price list with red leather covers of convenient size to carry in the pocket. There are nearly 30 pages devoted to illustrations and price-lists of their well known line of goods, followed by a number of blank pages for memoranda.

The Iowa Farming Tool Company, Fort Madison, Iowa, issue an illustrated catalogue for 1890 and 1891 of their manufactured goods. In addition to the goods shown in their last catalogue there are illustrations of a 15 fingered Cradle, the Columbia Socket Manure Fork and the Fort Madison Potato Digging Fork Fulcrum. A telegraph code is embodied in the catalogue. A note informs us that their works have run continuously 36 years.

E. T. Barnum, 179 Jefferson avenue, Detroit, Mich., issues an illustrated fall supplement, No. 330, for 1890, describing Flower Pot Stands, Roof Cresting, Wire Counter Railing, Wire and Iron Fences, Wire and Iron Window Guards, Stable Fixtures, Fire Escapes, Balcony Railing, Wire Signs, Jail Cells, Iron Beds, Builders' Wire and Iron Work, as manufactured by him. A number of unique designs are shown of Wrought Iron Window Guards, also of Polished Brass Wickets. Special designs of either of these kinds of work are furnished when desired.

Alfred Field & Co., 93 Chambers street, New York. issue an illustrated catalogue for the season of 1890-91, of Guns, Flobert's Rifles and Pistols carried in stock this season. They also carry in stock Goulcher's Gun Locks, Gun Nipples, Plugs and Nipples, Wad Punches, Gun Worms, Brass Ramrod Tips, as well as Wright's Anvils, Butcher Knives, Pocket Cutlery, Razors, Scissors, Table Cutlery, &c.

The Hoggson & Pettis Mfg. Company, New Haven, Conn., issue a reduced price-list of Steel Stamps for stamping Steel, Wood, Leather, Metals and other substances; also of Steel Figures and Alphabets for the same purpose. The same circular mentions that they manufacture Brass Checks for railroads, hotels, steamboats, factories, mines, foundries, &c. Also name and number Plates, Brands, Seals, &c. Brass Checks are, we are advised, finding increased use in machine shops, as each workman, on obtaining a tool, deposits a check, which shows where the particular tool is. They are also used in electric light plants, to prevent the current being turned on while men are working on the wires

L. M. Rumsey Mfg. Company, St. Louis, Mo., issue a handsome illustrated price-list, designated as catalogue No. 50. It is devoted to Brass Goods and Supplies. It is a cloth bound volume of nearly 600 pages, showing a full line of Sanitary Specialties, fine Brass Goods for Water, Steam and Gas, Pumps, Pipe, Fittings, Tools and General Supplies. It is intended as a complete book of reference for every day use by plumbers, gas fitters, steam fitters and the trade generally. The goods shown are alluded to as live issues, mostly kept in stock for immediate shipment. The lists are revised up to the moment of issue. The whole tone and arrangement of the catalogue is indicative of the energy and push which characterize this firm in all of their business enterprises. The work gives promise of serving the purpose for which it is intended, and will doubtless be of great usefulness to those interested in this class of goods.

The Millett Core Oven Company, Brightwood, Mass., issue a circular illustrating and describing Millett's Patent Core Oven which they manufacture. This oven has seven shelves or grates on which the cores are placed for baking, each shelf being independent of the other, and by means of a duplicate door on the back of the grate, when the grate is opened wide, closes the oven, thus retaining the heat. The extreme width of the oven front is 42 inches, the extreme hight 63 inches and tha width of the doors 32 inches. In the circular are printed a number of testi monial letters from prominent manufacturing concerns who have used these ovens with satisfactory results, and there is also distributed with the circular a separate testimonial letter from the Westinghouse Air Brake Company.

We are in receipt of the 1890 trade price-list of Frederick Malleson, 375 to 381 Kent avenue, Brooklyn, N. Y., of Fishing Tackle. This illustrates a large line of Reels, Jointed Rods, Hooks, Artificial Flies, Rod Trimmings, &c.

REVIEW OF THE WHOLESALE MARKET IN PAINTS AND OILS.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

Paints and Colors.

Unfavorable weather, which has been a more or less serious drawback to outdoor work in general, has interfered with the sale of Paints and Colors to a marked extent, and given the market a rather dull appearance throughout the week. Business in heavy goods used by grinders has also been rather slow. Otherwise there is nothing new to report for the week under review. Prices for all raw or crude materials keep very firm, and the general tendency is more in the direction of higher figures than otherwise for the general line of manufactured products, despite the momentary dullness.

White Lead.—The further rise in the cost of raw material has prompted corroders to raise their prices for White Lead ¼¢ ₱ lb in the face of very slow movement of the Pigment the past week. The new list is as follows :

White Lead, Dry or in Oil.

In kegs, lots of less than 1000 lb.....	7½¢
" " 1000 lb to 5 tons.....	7 ¢
" " 5 tons to 12 tons.....	6⅞¢
" " 12 tons and over.....	6¾¢
For 25 lb tin pails, add to keg price.....	½¢
" 12½ lb " " "	1 ¢
" 1 lb @ 5 lb assorted tins, add to keg price.....	2½¢

Red Lead and Litharge.—In sympathy with the rise on the prime Pigments prices for Red Lead and Litharge are advanced as follows :

	In kegs.	In barrels or half barrels.
Lots of less than 1000 lb..	7½¢	7¼¢
" 1000 lb to 5 tons..	7 ¢	6¾¢
" 5 tons to 12 tons..	6⅞¢	6⅝¢
" 12 tons or over...	6¾¢	6½¢

Zincs.—For domestic Oxide the market is showing a firmer tone. Prices have undergone no decided change, but sales have increased somewhat and full figures have been paid with little ceremony. No further change in foreign brands has taken place.

Colors.—For house painters' Colors the demand has been rather slow the past week, but Grinders' Colors have had very fair sales. In most lines the general situation is in sellers' favor, and prices remain firm.

Miscellaneous.—Block Chalk is somewhat variable in price, according to position of stock offered, and selling rather slowly. Whiting is steady at old figures, with about the usual movement, and Paris White remains without change.

Oils and Turpentine.

The chief features of interest in this line have been a large movement of crude Menhaden Oil, a rise in the price of Western Linseed Oil and rather more interest in Cotton Seed Oils for future delivery. These movements have served to give the market a rather livelier appearance and have also toned up some previous weak spots until now there is a good showing of firmness all along the line. Without exception, the prospects are now favorable for steady values throughout should nothing more than the regular demand be experienced, and the indications are that present low values will stimulate business later on in some lines.

Liuseed Oil.—The Linseed Oil Trust have withdrawn low prices lately quoted for their product delivered in the East, and are now asking 60¢. This move was occasioned by the position of the market for raw material. City crushers' prices remain at 62¢ for domestic and 64¢ for Calcutta seed product, but their sales are larger and the chances are that their figures will be marked up if seed advances much further.

Fish Oils.—About 9000 barrels o-crude Mehaden Oil have been sold, cleanf ing up the entire stock in the hands of Maine manufacturers, and taking a considerable quantity of Long Island Sound product also, This movement places the market in decidedly better position, and prices are up 1¢ @ 2¢ from the lowest point. Prices for Pressed and Bleached Menhaden are also firmer, but no higher this week than last.

Cotton Seed Oils.—Several lots of old crude have been sold at 28¢ for prime quality. New is offered at 27¢ here for November and December delivery, and some round lots are said to have been sold at 25¢ in the South. Prime Summer Yellow is obtainable at 33¢ for prompt or future delivery, and has very fair sales. Off grades are moving to a fair extent at proportionate prices.

Lard Oil.—There is a steady movement of fair sized lots for home account and some export business, the aggregate of which is sufficient to hold prices quite firm. Values are, however, no higher than they were a week ago.

Miscellaneous.—Cocoanut Oils are very firmly held, the supply being still under close control and the demand fair. Olive Oil is steady at old prices and quiet. Saponified Oil is firmer and in very fair request.

Spirits Turpentine.—Prices have ruled rather steadier during the week under review, and at this writing the range is 40¼¢ @ 40¾¢, as to style of package. The movement of supplies from first hands has been rather slow, however, and the market is devoid of new features.

The Minnesota Iron Company have declared a quarterly dividend of 1½ per cent., payable at the office of the treasurer, Mills Building, New York.

The Trojan Oil Can.

Peabody & Parks, Troy, N. Y., are introducing the Trojan Oil Can, as illustrated herewith. The can, when in use, is

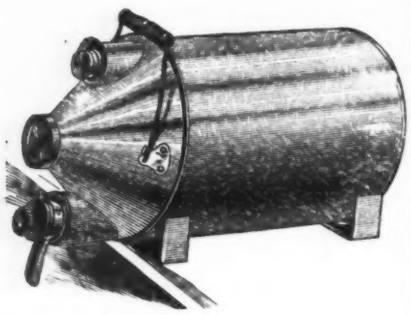


Fig. 1.—The Trojan Oil Can in Use.

placed in a horizontal position, resting on supports provided for this purpose, as shown in Fig. 1, allowing lamps to be filled with greater ease. The difficulty with faucet oil cans is the liability of the faucet to leak sooner or later. To overcome this trouble the faucet is placed on

Fig. 2.—The Trojan Can Stood on End to Prevent Leaking.

the top of the can, making it impossible to leak when standing on end. The faucet has a revolving spout, which can be turned out of the way to avoid being broken. The construction of the faucet is described as such that it cannot be accidentally turned back. These cans are made of galvanized iron, to contain 5 gallons.

The Reindeer Skate.

The American Skate Company, Thomas A. Lamotte, Philadelphia, Pa., manufacturers of the Reindeer Skates, in issuing their annual catalogue call attention to their original idea of grinding, and emphasize the fact that their Reindeer skate does not stand 1 inch on solid ice, as indicated in Fig. 1. Instead of grinding the runners flat, or nearly so, they poise the runner front and back of the center. The object of this grinding is to decrease friction, allowing one to skate with less feeling of being tired The Reindeer skates are only made in steel runners. Grades B. N. and P. N. are warranted welded steel. Fig. 2 shows the foot surface of the Reindeer skate. The catalogue describing the skates is artistic in design, being printed on various colors tinted paper, the whole held together by colored cord. The illustrations show the Reindeer in four grades of finish; wood top ladies' skates in three grades; rink roller skate in two grades; a strapped club, half clamp and all clamp skate, in one grade each; and the Reindeer skate in two grades, with leather mountings for ladies, making an attractive variety of skates.

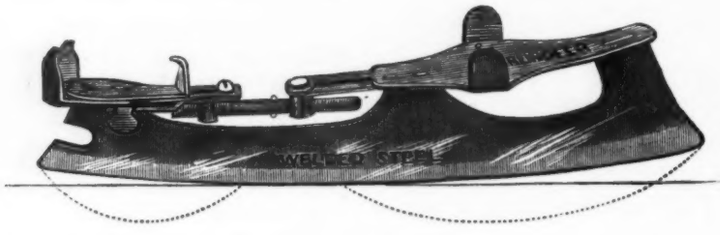


Fig. 1.—The Reindeer Skate.—Contact of the Runner on the Ice.

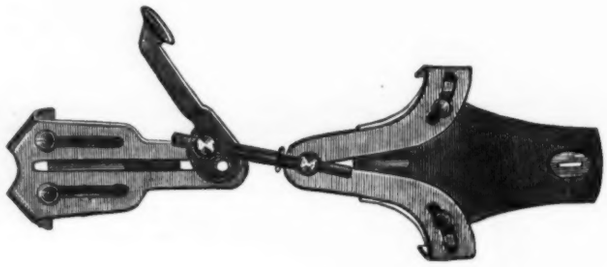


Fig. 2.—The Foot Surface of the Reindeer Skate.

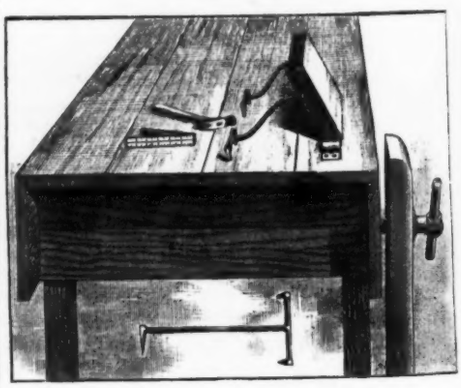
The Pan American Steel Tray Barrow.

The Kilbourne & Jacobs Mfg. Company, Columbus, Ohio, have recently purchased and placed upon the market a combination style of Barrow composed of wood frame and steel tray, under the name of Pan American, the subject of the accompanying illustration. It is referred to as first being put upon the market about four months since, at the earnest solicitation of one of their largest South American buyers, and was gotten up solely for export purposes. The construction of the barrow seemed, however, to meet the requirements of the domestic trade so well that it was decided to push them in the home market, since doing which the demand has been excellent. One of the weakest features in all wooden barrows is the tray or body. This being made of wide boards very soon warps and splits, thereby going to pieces and racking the entire barrow. This is especially true of barrows made for foreign shipment. The steel tray is especially designed to obviate the difficulty referred to, and while stronger, lighter and packing more closely together, increases the life of the barrow three fold. In view of the fact that it is difficult to obtain good seasoned lumber of the proper width and the low cost of steel, there is very little difference in the cost of the Pan American as between the all wood barrow. The tray is made exactly the same shape and size as the regular railroad wooden tray, and has a ¼ inch steel rod run around the outer edge of the tray over which the metal is rolled, thus materially strengthening and stiffening it.

The Pan American Steel Tray Barrow.

The Humphrey Tool Company Bench Claw.

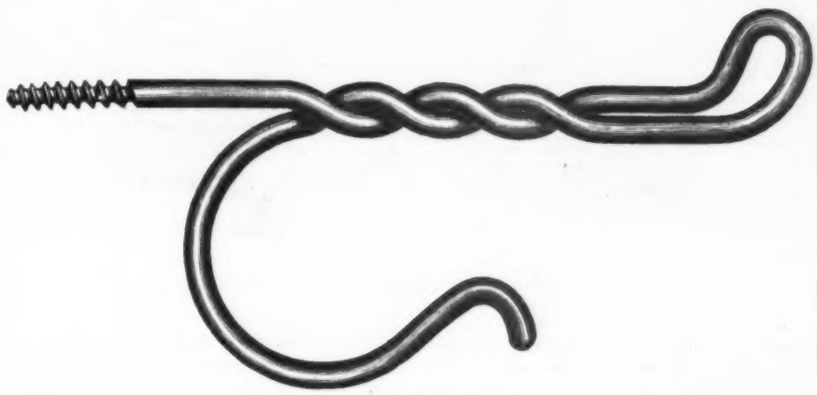
The Humphrey Tool Company, Warren, Mass., manufacturers of patented hardware specialties, are introducing bench claws, as illustrated herewith. These tools are intended to hold the work on a bench at any desired angle, the workman placing it firmly against the bench stop. The single spur of the bench claw is then driven into the work and the double spur into the bench, to be held firmly in any position required. These tools are made of cast steel, bronzed, for head or foot of work, a pair—right and left—being required on most jobs.



The Humphrey Tool Co. Bench Claw.

The "V Brace" Coat and Hat Hook.

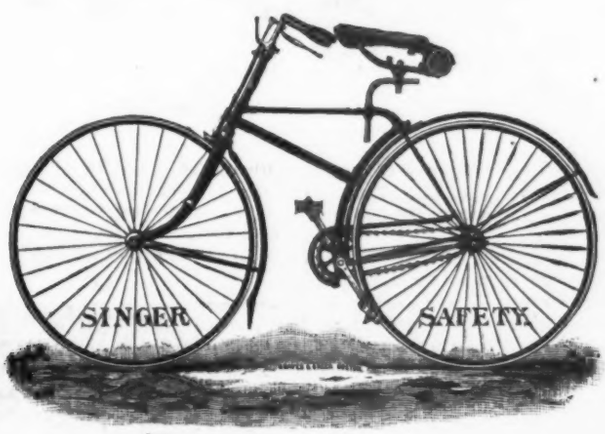
The Wire Goods Company, Worcester, Mass., are introducing a coat and hat hook, as illustrated herewith. They refer to this hook as strong, and make the point that the "V brace" formed by the lower hook resting against the wall makes it stiffer than the ordinary wire coat and hat hook. They announce that they intend this hook for their cheapest device, and that with their peculiar facilities and special automatic machinery they can produce it at a popular price and fill orders promptly.



The V-Brace Coat and Hat Hook.

Singer & Co.'s Safety Bicycle.

We herewith give an illustration of the safety bicycle for 1890, manufactured by Singer & Co., Coventry, England, with United States branch 6 and 8 Berkeley street, Boston, Mass.; W. L. Ross, manager. Among the changes made for the 1890 machine may be mentioned the patent steering lock, a new chain adjustment, the weight decreased, and other improvements in detail. In 1876 Singer wheels were on exhibition at the Centennial Exposition, since which time their business has increased until it has reached its present proportions both in England and America.



Singer & Co.'s Safety Bicycle.

The partition of Africa gives to British dominion and protection 880,000 square miles and 5,650,000 population. Within the sphere of British influence are 1,650,000 square miles and 30,000,000 people. The figures for France and Germany are as follows: French dominions and influence, 2,720,000 square miles; population, 17,000,000. German dominions and influence, 650,000 square miles, 250,000 population, with two large regions containing an area of 458,000 square miles not even guessed at as to population. The figures are from the London *Economist*, which does not see a rapid development of any of these dominions for many years to come.

The St. Louis Wire Mill Company.

The St. Louis Wire Mill Company, of St. Louis, Mo., are increasing their capacity in all departments. A number of new machines have been placed in the barb wire factory. Their wire nail plant has been increased by the addition of 25 machines. A battery of Babcock & Wilcox boilers is being erected, which is intended to supply steam to the entire works. There will be two sets of these boilers, capable of developing 800 to 900 horsepower. A brick building, 163 feet long by 75 feet wide, has just been erected for the galvanizing department. It will contain three galvanizing tanks with a daily capacity of 150,000 pounds. A notable improvement has been introduced here in the method of galvanizing wire. The coils of wire are taken just as they come from the drawing blocks. They are then run through a bath of molten lead, whence they are conducted to a tank containing a weak solution of muriatic acid, after which they enter the spelter tank, and are then coiled for future use or shipment. The purpose of the lead bath is to anneal the wire. In order that it may cool properly before entering the muriatic acid bath, it is taken back from the lead bath to pulleys hung from the roof trusses and then forward to pulleys located over acid tank, thus passing quite a long distance in the air. Asbestos brushes are used to clean the wire of superfluous spelter as it leaves the galvanizing tank. Ten wires are annealed, cleaned and galvanized at one time. The process employed has the advantage of saving time and labor, as compared with the old method of cleaning, annealing and pickling before galvanizing. The company now have a daily capacity in their works of 125 tons of barb wire, wire nails, &c., running double turn. It is thought that by next year their consumption of wire rods will be so heavy that it will take the entire product of a rod mill to supply them. The erection of a rod mill is therefore projected, the company's property being amply sufficient to furnish the space required for it.

It is estimated that $20,000 worth of merchandise has been stolen lately from freight trains on the Erie Railroad soon after leaving Jersey City by tramps and others supposed to be in league with them, who contrive to enter the cars and throw out bales, boxes, &c., while trains are in motion. Confederates hiding near the tracks hasten to seize the goods and carry them to a common rendezvous for distribution. Some arrests have been made and further disclosures are expected.

CONTENTS.

The MacKinnon Key-Way Cutter. Illus. .. 439
Testing the Largest Crane..... 439
Basic Bessemer Steel.—II.... 440
Triplex Electric Pump. Illustrated..... . 443
The Westinghouse Chicago Scheme.... 444
Packing Goods for Export..... 444
The New Uniform Freight Classification.... 444
Modern Blast Furnace Construction.—II. Illustrated..... 445
Direct Process of Making Iron and Steel. Illustrated 448
Leather Woven Link Belts. Illustrated.... 450
Water Circulator. Illustrated..... 450
The Week.... 451
Manufacturing: Iron and Steel, Machinery, Hardware, Miscellaneous..... 451-453
Personals..... 453
Virginia Iron Notes..... 453
Editorials:
The Money Stringency... 454
Are We Governed Too Much?..... 454
The Tin Plate Situation.... 455
The Uniform Freight Classification 455
The Senate Bill..... 456
Coke Ovens in the Birmingham District.... 456
The Demand for Rails..... 456
Southern Pig Iron Freights..... ... 457
Trade Report: Chicago, St. Louis, Cincinnati, Philadelphia, Louisville, Cleveland, Detroit, Pittsburgh, Chattanooga, New York, Financial, Metal Market, New York Metal Exchange, Coal Market, Imports, British Iron and Metal Markets 458-463
Hardware: The Condition of Trade, Barb Wire, Wire Nails, Cut Nails, Competition No. 5, Miscellaneous Prices, Obituary, Items, Price-Lists, Circulars, &c..... 464-469
Review of the Wholesale Market in Paints and Oils: Paints and Colors, Oils and Turpentine..... 469
The Trojan Oil Can. Illustrated..... ... 470
The Reindeer Skate. Illustrated... 470
The Pan American Steel Tray Barrow. Illustrated..... 470
The Humphrey Tool Company Bench Claw. Illustrated... 470
The "V Brace" Coat and Hat Hook. Illus. 471
Singer & Co's Safety Bicycle. Illustrated.. 471
The St Louis Wire Mill Company..... 471
Current Hardware Prices. 472-477
Paints, Oils and Colors... 477
Current Metal Prices 478

CURRENT HARDWARE PRICES.

SEPTEMBER 17, 1890.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

Adjusters, Blind.

Domestic.....₱ doz $3.00, 33⅓%
Excelsior.....₱ doz $10.00.....50&10&2%
Washburn's Self-Locking.....20@20&10%

Ammunition.—

Caps, Percussion, ₱ 1000—
Hicks & Goldmark's and Union Metallic Cartridge Co.
F. L. Waterproof, 1-10's.....34@35¢
E. B. Trimmed Edge, 1-10's.....46@48¢
E. B. Grnd. Edge, Cent. Fire, 1-10's.....46@47¢
Musket Waterproof, 1-10's.....50¢
G. D.....28¢
S. B. Genuine Imported.....45¢
Eley's E. B.....54¢ @ 55¢
Eley's D Waterproof, Central Fire...$1.60

Cartridges—
Rim Fire Cartridges.....50&5&2 %
Rim Fire Military.....15&2 %
Cent. Fire, Pistol and Rifle.....25&5&2 %
Cent. Fire, Military and Sporting 15&5&2 %
Blank Cartridges, except 22 and 32 cal., additional 10 % on above discounts.
Blank Cartridges, 22 cal., $1.75.....2 %
Blank Cartridges, 32 cal., $3.50.....2 %
Primed Shells and Bullets.....15&5&2 %
B. B. Caps, Round Ball, $1.75.....2 %
B. B. Caps, Con. Ball, Swgd., $2.00.....2%

Primers—
Berdan Primers, $1.00.....2%
B. L. Caps (for Sturtevant Shells) $1.00.....2%
All other Primers, $1.20.....2%

Shells—
First quality 4, 8, 10 and 12 gauge 25&10&2%
First quality, 14, 16 and 20 gauge ($10 list).....30&10&2%
Prize.....40&2%
Star, Club, Rival and Climax brands, 33⅓&10&2%
Selbold's Comb. Shot Shells.....15&2%
Brass Shot Shells, 1st quality.....60&2%
Brass Shot Shells, Club, Rival, Climax.. 65&2%

Shells Loaded—
Standard List, July 19, 1890..40&10&5%

Wads—Price per M.

U.M.C.&W. R. A.—B. E., 11 up...	68¢	Dis.20&2
U.M.C.&W. R. A.—B. E., 9&10...	82¢	
U.M.C.&W. R. A.—B. E., 8.....	96¢	
U.M.C.&W.R.A.—B. E., 7.....	$1.10	
U.M.C.&W. R. A.—P. E., 11 up..	1.15	
U.M.C.&W. R. A.—P. E., 9&10..	1.50	
U.M.C.&W. R. A.—P. E., 8.....	1.70	
U.M.C.&W.R.A.—P. E., 7.....	1.80	

Eley's B. E., 11 up.....$1.75
Eley's P. E., 11@20.....2.80

Anvils.—

Eagle Anvils, ₱ ℔ 10¢.....15@15&5%
Peter Wright's.....10½¢
Armitage's Mouse Hole.....9½¢
Armitage's Mouse Hole, Extra.11½@11½¢
Trenton.....9½@10¢
Wilkinson's.....9½@10¢
J. & Riley Carr, Pat. Solid.....11@11½¢
Moore & Barnes Mfg. Co.....33⅓%

Anvil Vise and Drill—
Millers Falls Co., $18.00.....20%
Cheney Anvil and Vise.....25%
Allen Anvil and Vise, $3.00.....40&10%
Star.....45&5 %

Apple Parers—See Parers, Apple, &c.

Augers and Bits—

Douglass Mfg. Co.
Wm. A. Ives & Co.
Humphreysville Mfg. Co.
French, Swift & Co. (F. H. Beecher, P. S. & W. Co.
Rockford Bit Company.
} 70@70& 10%

Cook's, Douglass Mfg. Co.....55 %
Cook's, N. H. Copper Co..50&10@50&10&5%
Ives' Circular Lip.....60%
Patent Solid Head.....30%
C. E. Jenning & Co., No. 10, extension lip.....40%
C. E. Jennings & Co., No. 30.....60%
C. E. Jennings & Co., Auger Bits, ₱ set, 32½ quarters, No. 5, $5; No. 30, $3.50..20%
Lewis' Patent Single Twist.....45%
Russell Jennings' Augers and Bits.25&10%
Imitation Jennings' Bits.....60@60&5%
Snell's Jennings Pattern.....60%
Pugh's Black.....20%
Rockford, Jenning's Pattern.....60%
Car Bits.....60@60&10%
Car Bits, P. S. & W. Co.....60&10%
Snell's Car Bits.....60%
L Hommodieu Car Bits.....15&10%
Forstner Pat. Auger Bits.....10%
Cincinnati Bell-Hangers' Bits...30&10%

Bit Stock Drills—
Morse Twist Drills.....50&10&5%
Standard.....50&10&5%
Cleveland.....50&10&5%
Syracuse, for metal.....50&10%
Syracuse, for wood (wood list).30&30&5%
Williams' or Holt's, for metal.50&10&10%
Williams' or Holt's, for wood...40&10%
Cincinnati, for wood.....30&10%
Cincinnati, for metal.....45&10%

Expansive Bits—
Clarks' small, $18; large, $26 .35@35&5%
Ives' No. 4, ₱ doz $60.....40%
Swan's.....40%
Steer's, No. 1, $26; No. 2, $22.....35%
Stearns' No. 2, $18.....20%

Gimlet Bits—
Common.....₱ gross $2.75@$3.25
Diamond.....₱ doz $1.10.....25&10%
Bee.....25&25&5%
Double Cut, Shepardson's.....45@45&10%
Double Cut, Ct. Valley Mfg. Co...30&10%
Double Cut, Hartwell's, ₱ gro.....$5.25
Double Cut, Douglass'.....40&10%
Double Cut, Ives'.....60@60&10%

Hollow Augers—

Ives	33⅓ @ 33⅓&10%
French, Swift & Co.	
Douglass'	

Bonney's Adjustable, ₱ doz $48....40&10%
Stearns'.....20&10%
Ives' Expansive, each $4.50.....50&5%
Universal Expansive, each $4.50.....20%
Wood's.....25@25&10%
Cincinnati Adjustable.....25&10%
Cincinnati Standard.....25&10%

Ship Augers and Bits—
L'Hommedieu's.....15&10@15&10&5%
Watrous'.....15&10@15&10&10%
Snell's.....15&10@15&10&5%
Snell's Ship Auger Patt'n Car Bits, 15&10@15&10@5%

Awl Hafts—See Hafts, Awl.

Awls, Brad Sets, &c—

Awls, Sewing, Common ₱ gr $1.70, 35%
Awls, Should. Peg, ₱ gr $2.45, 40@40&10%
Awls, Pat. Peg...₱ gr 63¢ ... 40@40&10%
Awls, Shouldered Brad..2.70 ₱ gr.....35%
Awls, Handled Brad...$7.50 ₱ gr.....45%
Awls, Handled Scratch ₱ gr, $7.50.35&10%
Awls, Socket Scratch, ₱ doz, $1.50.25@30%

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—

	Plain.	Beveled.
First quality	$8.00	$8.50
Others	7.50	8.00

Axle Grease—See Grease, Axle.

Axles—

No. 1 4½@5¢, No. 2 5½@6¾	3 % cash
Nos. 7 to 14.....55&5%	
Nos. 15 to 18.....47½%	
Nos. 19 to 22.....70%	

Concord Axles, loose collar.....5¢@6¢
Concord Axles, solid collar.....6¢@7¢
National Tubular Self-Oiling..... 33⅓%@33⅓&5%

Bag Holders.—See Holders, Bag.

Balances—

Spring Balances.....40%

	No. 2000	20	30
Chatillon, ₱ doz	$0.80	0.95	1.75 net

Chatillon Straight Balances.....40%
Chatillon Circular Balances.....50&10%

Bars.

Crow—
Cast Steel.....₱ ℔ 4½¢
Iron, Steel Points.....₱ ℔ 3½¢

Basins, Wash—

Standard Fiberware, No. 1, 10½-inch, $2; 12-inch, $2.25; 13½-inch, $2.75; 15-inch, $3.25.

Beams, Scale—

Scale Beams, List Jan. 12, '82...50&10@ 50&10&5%
Chatillon's No. 1.....40%
Chatillon's No. 2.....50%
Custer's.....33⅓%

Beaters, Egg, &c—

Keystone, P.D.&C., Each, No. 1, $1; No. 2, $2.....20 %
Dover.....₱ doz $1.50
Duplex (Standard Co.).....₱ doz $1.25
Rival (Standard Co.).....₱ doz $1.00
Duplex Extra Heavy (Standard Co.)... ₱ doz $3.50
Bryant's.....₱ gro $14.00
Double (H. & R. Mfg. Co).....₱ gro $16.20
Easy (H. & R. Mfg. Co.).....₱ gro $14.00
Triple (H. & R. Mfg. Co.).....₱ gro $16.20
Spiral (H. & R. Mfg. Co.).....₱ gro $4.50
Paine, Diehl & Co.'s.....₱ gro $24.00

Bells—

Cow—
Common Wrought.....60&10%
Western.....20&10%
Western, Sargent's list.....70&10%
Kentucky, "Star".....20&10%
Kentucky, Sargent's list.....70&10%
Dodge, Genuine Kentucky...70@70&10%
Texas Star.....50&10@50&10&5%
Call.....40@40&5%
Farm Bells.....₱ ℔ 3¢@3½¢
Steel Alloy Church and School Bells..40%

Door—
Gong, Abbe's.....33⅓&10%
Gong, Yankee.....45&10%
Gong, Barton's.....40&10@50%
Crank, Taylor's.....25&10%
Crank Brooks'.....50&10&2%
Crank Cone's.....10%
Crank, Connel's.....20&10%
Lever, Sargent's.....60&10%
Lever, Taylor's Bronzed or Plated....net
Lever, Taylor's Japanned.....25&10%
Lever, R. E. M. Co.'s.....50&10&2%
Pull, Brook's.....50&10&2%
Pull, Western.....25&10%

Electric,
Wollensak's.....20%
Bigelow & Dowse.....20%
Taylor's.....20%

Hand—
Light Brass.....75&10%
Extra Heavy.....65&10%
White Metal.....60&10&10%
Silver Chime.....33⅓&10%
Globe (Cone's Patent).....25&10@35%

Bellows—

Blacksmiths'.....60&5@65%
Molders'.....40@40&10%
Hand Bellows.....40&10@50%

Belting, Rubber—

Common Standard.....70@70&5%
Standard.....60&10&10@70%
Extra.....50&10@60%
N.Y.B.&P.Co., Carbon...50&5@50&10&5%
N.Y.B.&P.Co., Diamond....40&5@40&10%

Bench Stops—See Stops, Bench.

Benders, Upsetters, Tire.

Stoddard's Lightning Tire Upsetters..15%
Detroit Perfected Tire Bender.....15%

Bits—

Auger, Gimlet, Bit Stock, Drills, &c., see Augers and Bits.

Bit Holders—See Holders.

Blind Adjusters—See Adjusters, Blind.

Blind Fasteners—See Fasteners, Blind.

Blind Staples—See Staples, Blind.

Blocks—

Ordinary Tackle, list May 20, 1889... See Trade Report.
Cleveland Block Co., Mal. Iron.....50%
Moore's Novelty, Mal. Iron.....50%

Boards, Stove.

Wood Lined "Crystal".....50%
"Embossed".....50%
"Oxidized".....45%
Paper Lined Zinc.....55%
"Crystal".....55%
"Embossed".....55%
"Oxidized".....45%

Bolts—

Carriage, Machine, &c.—
Com. list June 10, '84.....70&10&7½&2%
Genuine Eagle, list Oct., '84...75&10@80%
Phila. pattern, list Oct. 7, '84..80@80&10%
R.B.&W., old list.....70%
Machine, list Jan. 1, 1890..... 75&10@75&10&5%
Bolt Ends, list Jan. 1, 1890..... 75&10@75&10&5%

Door and Shutter—
Cast Iron Barrel, Square, &c..70@70&10%
Cast Iron Shutter Bolts.....70@70&10%
Cast Iron Chain (Sargent's list)....65&10%
Ives' Patent Door Bolts.....60%
Wrought Barrel.....70@70&10%
Wrought Square.....70@70&10%
Wr't Shutter, all Iron, Stanley's..60&10%
Wr't Shutter, Brass Knob, " ..40&10%
Wr't Shutter, Sargent's list.....60&10%
Wr't Sunk Flush, Sargent's list...55&10%
Wr't Sunk Flush, Stanley's list...50&10%
Wr't B.K.Flush. Com'n " ...55&10%

Stove and Plow—
Stove.....60%
Plow.....60&5%
R. B. & W., Plow.....55%

Tire—
Common, list Feb. 28, '83.....65%
Port Chester Bolt and Nut Company:
Empire, list Feb 28, '83.....65%
Keystone, Philadel., list Oct. '84....80%
Norway, Phila., list Oct. '84.....75%
American Screw Company:
Norway, Phil., list Oct. 16, '84.....75%
Eagle, Phil., list Oct. 16, '84.....80%
Philadel., list Oct. 16, '84.....80%
Bay State, list Feb. 28, '83.....65%
R.B.&W., Philadel., list Oct. 16, '84....80%

Borers, Tap.

Common and Kind.....20&10%
Ive's Tap Borers.....33⅓&5%
Enterprise Mfg. Co.....20&10@30%
Clark's.....33⅓@35%

Borax.....₱ ℔ 9½@10½¢

Boring Machines—See Machines, Boring.

Bow Pins—See Pins, Bow.

Boxes, Wagon.

Per ℔.....2¾¢

Braces.—

American Bit Brace Co.:
Nos. 10, 12, 20.....60&10%
Nos. 11, 21, 24, 27.....70&10%
Nos. 22, 23, 25.....60&10&5%
Nos. 13, 26, 36, 37.....70&10&5%
Ball Braces, net.....$1.12 to $1.25¢
Amidon's
Barker's Imp'd Plain.....75&10@80%
Barker's Imp. Nickeled....65&10@70%
Ratchet.....75&10@80%
Eclipse Rachet.....60%
Globe Jawed.....40@40&10%
Corner Brace.....40@40&10%
Universal, 8 in., $2.10 10 in.....$2.25
Buffalo Ball.....$1.10@$1.15
Barber's,
Nos. 10 to 16.....50%
Nos. 30 to 33.....50%
Nos. 40 to 63.....50&10%
Barker's,
Nos. 8, 10 and 12.....75&10@80%
Plated, Nos. 8, 10 and 12....65&10@70%
Bartholomew's,
Nos. 25, 27 and 30.....50&10@60&5%
Nos. 117, 118, 119.....70@70&5%
Common Ball, American.....$1.00@$1.10
Fray's Genuine Spofford's..50&5@50&10%
Fray's No. 70 to 120, 81 to 123, 207 to 414 50&10%
Ives' New Haven Novelty.....70@70&5%
New Haven Ratchet.....60&5@60&10%
Barber Ratchet.....60&5@60&10%
Barbers.....60&5%
Spofford.....60&5@60&10%
Osgood's Ratchet.....40&10@50%
P. S. & W. Co., Peck's Patent.....60%

Brackets—

Shelf plain, Sargent's list, 55&10@55& 10&10%
Shelf, fancy, Sargent's list, 60&10@60 &10&10%
Reading, plain.....50&10@60&10&5%
Reading, Rosette.....60&10@60&10&10%

Bright Wire Goods—See Wire.

Broilers—

Henis' Self-Basting.	Inch	9	10	9x11
	Per doz	$4.50	5.50	6.50

New Haven.....50%

Buckets, Well.

Galvanized—
Hill's.....₱ doz, 12 qt, $4.25; 14 qt, $5.25
Iron Clad.....₱ doz. 14 qt, $4.25@$4.50
Helwig's Flat Iron Band.....$4.25@4.50
Helwig's Wired Top....₱ doz $4.00@4.25

Bull Rings—See Rings, Bull.

Butcher's Cleavers—See Cleavers Butchers'.

Butts—

Brass—
Wrought Brass.....75&10@80%
Cast Brass, Tiebout's'.....50%
Cast Brass, Corbin's, Fast.....33⅓&10%
Cast Brass, Loose Joint.....33⅓&10%

Cast Iron—
Fast Joint, Narrow.....50&10&5@60%
Fast Joint, Broad.....50&10@60%
Loose Joint.
Loose Joint, Japanned.
Loose Joint, Jap. with Acorns..
Parliament Butts.
Mayer's Hinges.
Loose Pin, Acorns.
Loose Pin, Acorns, Japanned...
Loose Pin, Acorns, Japanned, Plated Tips.
} .70&5@ 70&10%

Wrought Steel—
Fast Joint, Narrow.
Fast Joint, Lt. Narrow.
Fast Joint, Broad.
Loose Joint, Broad.
Table Butts, Back Flaps, &c.....
Inside Blind, Regular.
Inside Blind, Light.
Loose Pin.
} .70&5@ 70&10%

Bronsed Wrought Butts.....50

Calipers—See Compasses.

Calks, Toe—

Gautier.....₱ ℔ 5½@6¢
Dewicks (Burke).....₱ ℔ 5½@6¢

Can Openers—See Openers, Can.

Cards—

Horse & Curry.....10&10&10&10%
Cotton.....10&10&10%
Wool.....10&10&10%

Carpet Stretchers—See Stretchers Carpet.

Carpet Sweepers—See Sw Carpet.

Cartridges—See Ammunition.

Casters—

Bed....	Brass....	55@55&10%
Plate....	Others...	60@60&10%

Shallow Socket.
Deep Socket.....40&10%
Yale Casters, list May, 1884...30&10@40%
Yale, Gem.....60@60&5%
Martin's Patent (Phœnix).....45&10&50%
Payson's Anti-friction.....60@60&10%
Giant Truck Casters.....30%
Stationary Truck Casters.....50&10%
Socket Truck Casters.....50%

Cattle Leaders—See Leaders, Cattle.

Chain—

Trace, Wagon and Fancy Chains, List revised April 21, 1890.....50& 10@60%

American Coil, in cask lots,

3-16	¼	5-16	⅜	7-16	½	⅝	¾
$7.75	5.45	4.55	4.00	3.65	3.50	3.40	3.30

Less than cask lots, add ¼@½¢ ₱ ℔.
German Coil, list of June 20, 1887 50&10&5@60%
German Halter Chain, list of June 20, 1887.....50&10&5@60%
Covert Halter.....60&2%
Covert Traces.....35@2%
Covert Heel Chain.....50&2%
Onedia Halter Chain.....60@60&5%
Galvanized Pump Chain.....₱ ℔ 5½@6¢
Jack Chain, Iron.....75&10@80%
Jack Chain, Brass.....75@75&10%

Chalk—

White.....₱ gr 50¢
Red.....₱ gr 70¢
Blue.....₱ gr 85¢
See also Crayons.

Chalk Lines—See Lines.

Chisels—

Socket Framing and Firmer.
P. S. & W.
New Haven.
Witherby.
Mix.
Ohio Tool Co.
} ..75 @ 75&10

Douglass.....75@75&5%
Buck Bros.....30%
Merrill.....60&10@60&10&5%
L. & I. J. White.....50@50&5%

Tanged and Miscellaneous.
Tanged Firmers.....40&10@50%
Butchers'.....$4.75@$5.00
Spear & Jackson's.....$5 to $
Buck Bros.....30%
Cold Chisels, ₱ ℔.....15@16%

Chucks—

Beach Pat.....each, $8.00.....20%
Morse's Adjustable, each, $7.00, 20@20&5%
Danbury.....each, $6.00, 30@30&5%
Syracuse, Bals Pat.....25%
Skinner's Patent Chucks.
Combination Lathe Chucks.....33⅓&5%
Universal Lathe Chucks.....40%
Independent Lathe Chucks.....40%
Drill Chucks.....15%
Union Mfg. Co.,
Victor.....$8.50, 25%
Combination.....40%
Universal.....40%
Independent.....40%

Churns.

Tiffin Union No. 1, 5 gallon...$3.25 each
Tiffin Union No. 2, 7 gallon...$3.75 each
Tiffin Union No. 3, 10 gallon...$4.25 each

Clamps—

R. I. Tool Co.'s Wrought Iron.....25%
Adjustable, Cincinnati.....15&10%
Adjustable, Hammers.....15%
Adjustable, Stearn's.....30@30&10%
Stearn's Adjustable Cabinet and Corner.....30@30@10%
Cabinet, Sargent's.....66⅔&10%
Carriage Makers', Sargent's.....70&10%
Carriage Makers', P., S. & W. Co..40&10%
Eberhard Mfg. Co.....40&5@40&10%
Warner's.....40&10@40&10&5%
Saw Clamps, see Vises, Saw Filers'.
Carpenters', Cincinnati.....25&10%

Cleavers.

Butchers'.
Bradley's.....25@30%
L. & I. J. White.....20&5%
Beatty's.....40@40&5%
New Haven Edge Tool Co.'s.....40%
P., S. & W.....33⅓&5@33⅓&10%
Foster Bros.....30%
Schulte, Lohoff & Co.....40@40&5%

Clips—

Norway, Axle, ¼ & 5-16.....55&5&5%
2nd grade Norway Axle, ¼ & 5-16 65&5%
Superior Axle Clips.....66⅔&5&70%
Norway Spring Bar Clips, 5-16..60&5&5%
Wrought-Iron Felloe Clips.....₱ lb, 5½¢
Steel Felloe Clips.....₱ lb, 5¢
Baker Axle Clips.....15%

Cloth and Netting, Wire—See Wire, &c.

Cockeyes.....50%

Cocks, Brass.

Hardware list.....50&2%

Coffee Mills—See Mills, Coffee.

Collars, Dog, &c.

Medford Fancy Goods Co.....40&10%
Embossed, Gilt, Pope & Steven's list 30&10%
Leather, Pope & Steven's list.....40%
Brass, Pope & Steven's list.....40%
Chapman Mfg. Company.....50&10@60%

Combs, Curry.

Fitch's.....50&10@50&10&10%
Rubber, per doz $10.00.....20%
Perfect.....50%

Compasses, Dividers, &c.—

Compasses, Calipers, Dividers.70@70&10%
Bemis & Call Co.'s
Dividers.....60&5%
Compasses & Calipers.....50&5%
Wing and Inside or Outside.....50&5%
Double.....60%
(Call's Pat. Inside).....30%
Excelsior.....50%
J. Stevens & Co.'s.....25&10%
Starrett's
Spring Calipers and Dividers....25&10%
Lock Calipers and Dividers.....25%
Combination Dividers.....25%

Coopers' Tools—See Tools, Coopers'.

Cord, Sash—

Common.....₱ lb 10@11¢
Patent, good quality.....₱ lb 13@13½¢
White Cotton Braided, fair...₱ lb 28@29¢
Common Russia Sash.....₱ lb 13½¢
Patent " " .....₱ lb 16¢
Cable Laid Italian Sash.....₱ lb 22@23¢
Indian Cable Laid " ... .₱ lb 13¢
Silver Lake—
A Quality, White, 50¢.....10&10&5%
A Quality, Drab, 55¢.....10&10&5%
B Quality, White, 50¢.....28@30%
B Quality, Drab, 55¢.....31@33%
C Quality, White (only).....26½¢@28¢
Sylvan Spring, Extra Braided, White, 34¢
Sylvan Spring, Extra Braided, Drab..39¢
Semper Idem, Braided, White.....30¢
Egyptian, India Hemp, Braided.....25¢
Samson—
Braided, White Cotton, 50¢...30@30&5%
Braided, Drab Cotton, 55¢....30@30&5%
Braided, Italian Hemp, 55¢...30@30&5%
Braided, Linen, 80¢.....30@30&5%

Corkscrews—See Screws, Cork.

Corn Knives and Cutters—See Knives, Corn.

Crackers, Nut—

Table (H. & B. Mfg. Co.).....40%
Blake's Pattern.....₱ doz $2.00, 10%
Turner & Seymour Mfg. Co.....50%

Cradles—

Grain.....50&5&2@50&10&2%

Crayons.

White Crayons, ₱ gr, 12¢@12½¢.....10%
D. M. Stewart Mfg. Co., Metal Workers, ₱ gr, $2.50.....25%
D. M. Stewart Mfg. Co., Rolling Mill, ₱ gr, $2.50.....25%
See also Chalk.

Crow Bars—See Bars, Crow.

Curry Combs—See Combs, Curry.

Curtain Pins—See Pins Curtain.

Cutters—

Meat.
Dixon's ₱ doz.....40&5%
Nos.... 1 2 3 4
$14.00 $17.00 $19.00 $20.00
Woodruff's ₱ doz.....40&5%
Nos.... 100 150
$15.00 $18.00
Hales Pattern ₱ doz.....70@70&5%
Nos.... 11 12 13
$27.00 $33.00 $45.00
American.....30%
Nos..... 1 2 3 4 B 5
Each.....$5 $7 $10 $25 $50 $60
Enterprise.....30%
Nos.....10 12 22 52 42
Each.....$3 $2.50 $4 $6 $15
Great American Meat Cutter.....30%
Nos..... 112 116 118 120 122
Each.....$2.00 $2.75 $3.00 $2.50 $4.00
Miles' Challenge ₱ doz.....45@45&10%
Nos..... 1 2 3
$22.00 $30.00 $40.00
Home No. 1.....₱ doz, $26.00, 55&10%
Draw Cut, each:
Nos..5 2 6 8
$50 $75 $80 $225 .....20@25%
Great American.....30%
Beef Shavers (Enterprise).....20&10@30%
Little Giant.....50%
Chadborn's Smoked Beef Cutter, ₱ doz $56.00.

Tobacco.
Champion.....20&10@30%
Wood Bottom.....₱ doz $5.00@$5.25
All Iron.....₱ doz $4.25
Nashua Lock Co.'s..₱ doz, $18.00 50@55%
Wilson's.....55%
Sargents's.....₱ doz, $24, 55&10%
Acme.....₱ doz $20.00, 40%
Washer.
Smith's Pat.....₱ doz $12.00, 20&10&10%
Johnson's.....₱ doz $11.00, 33⅓%
Penny's, ₱ doz Pol. $14; Jap'd, $16.00, 55%
Appleton's.....₱ doz $16.00, 60&10%
Bonney's.....30&10%
Cincinnati.....25&10%

Cutlery—

Beaver Falls & Booth's.....33⅓
Wostenholme.....$7.75 to $

Dampers, &c—

Dampers, Buffalo.....40&10%
Buffalo Damper Clips.....40&10%
Crown Damper.....40%
Excelsior.....40&10%

Diggers, Post Hole, &c.—

Samson Post Hole Digger, ₱ doz $36.00, 25%
Fletcher Post Hole Augers, ₱ doz $36, 20%
Eureka Diggers.....₱ doz $16.00@17.00
Leed's.....₱ doz $8.00@9.00
Vaughan's Post Hole Auger, ₱ doz $13.00@14.00
Kohler's Little Giant.....₱ doz. $18.00
Kohler's Hercules.....₱ doz. 15.00
Kohler' New Champion.....₱ doz. $9.00
Schniedler.....₱ doz. $18.00
Ryan's Post Hole Diggers..₱ doz $24.00
Cronk's Post Bars, ₱ doz $60.00, 50&5&50&10%
Gibbs Post Hole Digger, ₱ doz $30.00, 50¢
Imperial, ₱ doz $15.....45%

Dividers—

See Compasses.

Dog Collars—See Collars, Dog, &c.

Door Springs—See Springs, Door.

Drawers.

Money, ₱ doz.....$18&$20

Drawing Knives—See Knives, Drawing.

Drills and Drill Stocks—

Blacksmiths'.....each $1.75
Blacksmiths' Self-Feeding, each $7.50, 20%
Breast, P. S. & W.....40&10%
Breast, Wilson's.....30&5%
Breast, Millers Falls.....each $3.00, 25%
Breast, Bartholomew's....each $2.50, 25&10&40%
Ratchet, Merrill's.....20@20&5%
Ratchet, Ingersoll's.....25%
Ratchet, Parker's.....20@20&5%
Ratchet, Whitney's.....20&10%
Retchet, Weston's.....20@25%
Ratchet, Moore's Triple Action..25@30%
Ratchet, Curtis & Curtis.....30%
Whitney's Hand Drill, Plain, $11.00; Adjustable, $12.00.....20&10%
Wilson's Drill Stocks.....10%
Automatic Boring Tools.....$1.75@$1.85
Twist Drills—
Morse.....50&10&5%
Standard.....50&10&5%
Syracuse (Metal list).....50&10%
Cleveland.....50&10&5%
Williams.....50&10&10%
New Process.....50&10&5%

Drill Bits.—See Augers and Bits.

Drill Chucks.—See Chucks.

Dripping Pans-See Pans, Dripping.

Drivers, Screw.

Douglas Mfg. Co.....20@20&10%
Disston's.....60%
Buck Bros.....30%
Stanley R. & L. Co.'s
Varnished Handles.....65&10%
Black Handles.....60&10%
Sargent & Co.'s
No. 1 Forged Blade.....60&10&10%
Nos. 20, 30 and 60.....66⅔&10&10%
P. S. & W.....70 %
Knapp & Cowles No. 1.....60&20&70%
No. 1 Extra.....60@60&10
Nos. 00 & 4.....50&5@50&10&5%
Stearns'.....25&10&5%
Gay & Parsons.....35%
Champion.....25&10%
Clark's Pat.....30@33⅓%
Crawford's Adjustable.....30%
Ellrich's Socket and Ratchet..25@25&10%
Allard's Spiral, new list.....25%
Kolb's Common Sense ₱ doz $6.00, 25&10%
Syracuse Screw-Driver Bits...30&30&5%
Screw-Driver Bits.....₱ doz. 50@75¢
Screw-Driver Bits, Parr's.....₱ gro $6.25
Fray's Hol. Hdle. Sets. No. 3, $12.00, 25@25&10%
P. D. & Co.'s all Steel.....50%
Cincinnati.....25&10%
Brace Screw Drivers.....25&10%
Buck Bros.' Screw-Driver Bits.....%

Egg Beaters.—See Beaters, Egg.

Egg Poachers.—See Poachers, Egg.

Electric Bell Sets.—See Bells, Electric.

Emery.—No. 4 to No. 54 to Flour, CF

	46 gr.	150 gr.	F. FF.
Kegs, ₱ lb	4½¢	5 ¢	2½¢
½ kegs, ₱ lb	4¾¢	5½¢	2¾¢
¼ kegs, ₱ lb	5 ¢	5½¢	3 ¢
10-lb cans, 10 in case	6 ¢	6¼¢	5 ¢
10-lb cans, less than 10	10 ¢	10 ¢	7½¢

Enameled and Tinned Ware—See Ware, Hollow.

Escutcheon Pins—See Pins, Escutcheon.

Escutcheons.

Door Lock....Same dis as Door Locks.
Brass Thread.....60@60&10%
Wood.....25%

Expanded Metal.

List No. 5.

Lathing.....10%
Fencing, Painted Sheets.....20%
Netting, Painted Sheets.....20%
Door Mats, Galvanized.....25%
Window Guards, Paneled.....15%
Tree Guards, Paneled.....15%

Fasteners, Blind—

Mackrell's, ₱ doz. $1.00.....20@20&10%
Van Sand's Screw Pat., $15 ₱ gr..60&10%
Van Sand's Old Pat., $15.00 ₱ gr..55&10%
Washburn's Old Pattern, ₱ gr.....$9.00
Merriman's.....new list
Austin & Eddy No. 2008 ₱ gr.....$9.00
Security Gravity, ₱ gr.....$9.00

Faucets.—

Fenn's.....40%
Bohren's Pat. Rubber Ball.....25%
Fenn's Cork Stops.....33⅓%
Star.....60%
Frary's Pat. Petroleum.....40&5&2%
B. & L. B. Co.
West's Lock, Open and Shut Key...50%
Star, Metal Plug, new list.....40%
Lockport, Metal Plug, reduced list..60%
Metallic Key, Leather Lined...60&10@ 60&10&10%
Cork Lined.....70&5@70&10%
Burnside's Red Cedar.....50%
Burnside's Red Cedar, bbl lots....50&10%
John Sommers'
Peerless Best Block Tin Key.....40%
IXL, 1st quality, Cork Lined.....50%
Diamond Lock.....40%
Perfection, Fla. Red Cedar.....50%
Goodenough Cedar.....50%
Boss Metallic Key.....50%
Reliable Cork Lined.....60%
Western Pattern Cork Lined.....50%
Self-Measuring
Enterprise, ₱ doz $50.00.....20&10%
Lane's, ₱ doz $36.00.....25&10%
Victor, ₱ doz $36.00.....25&10%

Felloe Plates—See Plates, Felloe.

Fifth Wheels.—

Derby and Cincinnati.....45&5%
Brewster.....50&5%

Files—

Domestic—
Nicholson Files, Rasps, &c.....60&10@60&10&5%
Nicholson (X. F.) Files.....25%
Nicholson's Royal Files (Seconds).....75% (extra prices on certain sizes)
Other makers, best brands.....60&10@50&20%
Fair brands.....60&10&10@70&5%
Second quality.....70&10@75&10%
Nicholson's Horse Rasps....60&10@60& 10&5%
Heller's Horse Rasps.....50&7½@50&10%
McCaffrey's Horse Rasps.....50&10%
Chelsea Horse Rasps, Hand Cut...50&10%
Imported—
Moss & Gamble....List, April 1, 1883, 15%
Butcher.....Butcher's list, 20%
Stubs.....Stubs list, 25@30%
Turton's.....Turton's list, 20@25%
Greaves' Horse Rasps..American list, 60%

Fixtures.

Grindstone—
Sargent's Patent.....70&10%
Reading Hardware Co.....30&10%
P., S. & W. Co.....50&10%

Fluting Machines—See Machines, Fluting.

Fluting Scissors—See Scissors, Fluting.

Fodder Squeezers—See Squeezers, Fodder.

Forks—

Hay, Manure, &c., Asso List.....70%
Hay, Manure, &c., Phila. List. 60@60&5%
Plated, see Spoons.

Frames—

Saw—
White Vermont.....₱ gro $9.00@10.00
Red, Polished and Varnished.....₱ doz $1.50, 25%

Screen, Window and Door—
Porter's Pat. Window and Door Frame. 33⅓&10%
Warner's Screen Corner Irons..33⅓@ 33⅓&10%
Stearns' Frames and Corners..25@25&10%

Freezers, Ice Cream—

White Mountain.....60@60&5%
Granite State.....65@65&5%
Arctic.....70@70&5%
American.....60%
Buffalo Champion.....65@65&5%
Shepard's Lightning.....65@65&5%
Gem.....65%
Blizzard.....70%
Double Action Crown.....60%
Crown.....60%
Star.....60
Peerless and Giant.....60&10
Zero and Pet.....65&1
Boss.....65&10&1
Keystone, P. D. & Co., each, $1.50....20%

Fruit and Jelly Presses—See Presses, Fruit and Jelly.

Fry Pans—See Pans, Fry.

Funnels.

Gersdorff's Perfection, Standard and Globe; *Tin*, 1 gro., 10 %; 2 to 5 gro., 20 %; 5 to 10 gro.....30 %
Copper, 1 to 6 doz., 15 %; 6 to 12 doz., 20 %; over 12 doz.....25 %

Fuse— ₱ 1000 ft
Common Hemp Fuse, for dry ground..$2.70
Common Cotton Fuse, for dry ground 2.85
Single Taped Fuse, for wet ground..
Double Taped Fuse, for very wet gr. 4.85
Triple Taped Fuse, for very wet gr.. 5.60
Small Gutta Percha Fuse, for water. 7.50
Large Gutta Percha Fuse, for water.12.00

Gates, Molasses—

Stebbin's Pattern.....75&10@80%
Stebbin's Genuine.....60&10&10%
Stebbin's Tinned Ends.....40&10%
Chase's Hard Metal.....50&10%
Bush's.....20%
Lincoln's Pattern.....70@70&10%
Weed's.....20&10%
Boss, ₱ doz:
No. 1, $7; No. 2, $8; No. 3, $9; No. 4, $10.....60&10&10%

Gauges.

Marking, Mortise, &c.....60&10%
Starrett's Surface, Center and Scratch. 25&10%
Wire, low list.....10&10%
Wire, Wheeler, Madden & Co.....10%
Wire, Morse's.....25%
Wire, Brown & Sharpe's.....10@20%
Wire, P. S. & W. Co.....10&10%

Gimlets—

Nail and Spike.....50&10&5%
"Eureka" Gimlets.....40&10%
"Diamond" Gimlets.....₱ gr $5.00
Double Cut, Shepardson's.....45@45&5%
Double Cut, Ives'.....60@60&5%
Double Cut, Douglass'.....40&10%
"Bee," ₱ gr $12.....25@25&5%

Glue—

Le Page's Liquid.....25@25&5%
Upton's Liquid.....35%
Le Page & Co.'s Improved Process 25@25&5%

Glue Pots—See Pots, Glue.

Grease, Axle.

Fraser's.....Keg ₱ lb 4¢, Pail ₱ lb 5¢
Fraser's, in boxes.....₱ gr $9.50
Dixon's Everlasting, in bxs...₱ doz lb $1.20; 2 lb $2.00
Dixon's Everlasting....10-lb pails, ea. 35¢
Lower grades, special brands, ₱ gr $5.50@$7.00

Grindstones—

Small, at factory.....₱ ton $7.50@9.00

Grindstone Fixtures—See Fixtures, Grindstone.

Hack Saws—See Saws.

Hafts, Awl.

Sewing, Brass Fer. ₱ gr, $3.50.....45&10%
Pat. Sewing, Short, $1.00 ₱ doz.....40&10%
Pat. Sewing, Long.....₱ doz $1.20
Pat. Peg, Plain Top, ₱ gr $10.00...45&10%
Pat. Peg, Leather Top, ₱ gr $12.00.45&10%

Halters.

Covert's, Rope, ½-in. Jute.....50&2%
Covert's, Rope, ½-in. Hemp.....50&2%
Covert's Adj. Rope Halters.....40&2%
Covert's Hemp Horse and Cattle Ties, 50&2%
Covert's Jute Horse and Cattle Ties, 60&10&2%
Covert's Adj. Web Halters.....35&2 %

Hammers—

Handled Hammers—
Maydole's, list Dec. 1, '85.....25&10@35%
Buffalo Hammer Co.
Humason & Beckley
Atha Tool Co.
Fayette R. Plumb
C. Hammond & Son
Hartford Hammer Co.
Verree.....50@50&10%
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 & 1.75.....30&10%
Nelson Tool Works.....40&10%
Warner & Nobles.....20@25
Peck, Stow & Wilcox.....40%
Sargent's.....33⅓&10%
Heavy Hammers and Sledges—
3 lb and under.....₱ lb 40¢
3 to 5 lb.....₱ lb 36¢ } 70@70&10%
Over 5 lb.....₱ lb 30¢ }
Wilkinson's Smiths.....10½¢@11¢₱ lb

Handcuffs and Leg Irons—See Police Goods,

Handles—

Atkins' No. 1 Loop, ₱ pair, 28¢; No. 2, 13¢; No. 6, 16¢; No. 2 and No. 4 Reversible, 18¢.
Cross-Cut Saw Handles—
Boynton's Loop Saw Handles, 50¢....60%
Champion.....18%
Iron, Wrought or Cast—
Door or Thumb.

Nos.....	0	1	2	3
Per doz....	$0.90	1.00	1.18	1.35 1.50

60&10&1½%

Roggin's Latches.....₱ doz 30@@35¢
Bronze Iron Drop Latches..₱ doz 70¢ net
Jap'd Store Door Handles—Nuts, $1.62; Plate, $1.10; no Plate, $0.88..... net
Barn Door, ₱ doz $1.40..... 10&10%
Chest and Lifting.....70%

Wood—

Saw and Plane.....40&10@40&10&5%
Hammer, Hatchet, Axe, Sledge, &c...40%
Brad Awl.....₱ gr $2.00
Hickory Firmer Chisel, ass'd. ₱ gr 4.50
Hickory Firmer Chisel, large. ₱ gr 5.00
Apple Firmer Chisel, ass'd...₱ gr 5.00
Apple Firmer Chisel, large...₱ gr 6.00
Socket Firmer Chisel, ass'd...₱ gr 3.00
Socket Framing Chisel, ass'd. ₱ gr 5.00
} dis 40%
J. S. Smith & Co.'s Pat File.....50%
File, assorted..... ₱ gr ₱ 75 } 40@
Auger, assorted..... ₱ gr 5.00 } 40&10%
Auger, large..... ₱ gr 7.00 }
Pat. Auger, Ives'.....30&10%
Pat. Auger, Douglass.....₱ set $1.22
Pat. Auger, Swan's.....₱ set $1.00
Hoe, Rake, Shovel, &c.....50&10%

Hangers—

Barn Door, old patterns...60&10&10@70%
Barn Door, New England...60&10&10@70
Samson Steel Anti-Friction.....55%
Orleans Steel.....55%
Hamilton Wrought Wood Track.....55%
U. S. Wood Track.....55%
Champion.....60&10%
Rider and Wooster, Medina Mfg. Co.'s list.....70%
Climax Anti-Friction.....60%
Climax Anti-Friction for Wood Track55%
Zenith for Wood Track.....55%
Reed's Steel Arm.....50%
Challenge, Barn Door.....50%
Sterling's Imp'ved (Anti-Friction).65&10%
Victor, No. 1, $15.00; No. 2, $16.50; No. 3, $18.00.....50&2%
Cheritree.....50&10%
Kidder's.....50&10@60%
The Boss.....60&10%
Best Anti-Friction.....60&10%
Duplex (Wood Track).....60&10&5%
Terry's Pat., ₱ doz pr. 4 in, $10.00; 5 in. $12.00.....50&10%
Terry's Steel Anti-Friction Leader 50&10%
Terry's Steel Anti-Friction Ideal..50&10%
Cronk's Patent, Steel Covered.....50@5%
Wood Track Iron Clad, ₱ ft. 10¢.....50 &15@60%
Carrier Steel Anti-Friction.....50&10%
Architect, ₱ set $6.00.....20%
Eclipse.....20&10%
Felix, ₱ set $4.50.....20%
Richards'.....30@30&10%
Lane's Standard.....50&5@50&10%
Lane's New Standard.....50@50&5%
Ball Bearing Door Hanger..20&10@25&10%
Warner's Pat.....20&10@20&10&10%
Stearns' Anti-Friction.20&10@20&10&10%
Stearns' Challenge.....25&10@25&10&10%
Faultless.....40@40&5%
American, ₱ set $6.00.....20&10%
Rider & Wooster, No. 1, 62½¢; No. 2, 75¢.....40%
Paragon, Nos. 1, 2 and 3.....40&10%
Cincinnati.....25&10%
Paragon, Nos. 5, 5½, 7 and 8.....20&10%
Crescent.....60@60&10%
Nickel Cast Iron.....50%
Nickel, Malleable Iron and Steel.....40%
Scranton Anti-Friction Single Strap33⅓%
Wild West, 4 in. Wheel, $15.00; 5 in. Wheel, $21.00.....45%
Star.....40&10@40&10&5%
May.....50&5@50&10%
Barry, $6.00.....40&10%

Harness Snaps—See Snaps.

Hatchets—

American Axe and Tool Co.
Blood's.....
Hunt's.....
Hurd's.....
Mann's.....
Peck's.....
Underhill's.....
} 40 & 10 @ 50&5 %
Buffalo Hammer Co.....
Fayette R. Plumb.....
C. Hammond & Son.....
Kelly's.....
Sargent & Co.....
P., S. & W. Co.....
Ten Eyck Edge Tool Co.....
Collins.....10%
Schulte, Lohoff & Co.....50&50&5%

Hay and Straw Knives—See Knives.

Hinges—

Blind Hinges—

Parker.....75&2%
Palmer.....50&5&10%
Seymour.....70&2%
Nicholson.....45&10%
Huffer.....50%
Clark's, Nos. 1, 3, 5, 40 and 50 75&10&5@80%
Clark's Mortise Gravity.....50%
Sargent's, Nos. 1, 3, 5, 11, 13 75&10@55&10&5%
Sargent's, No. 12.....77&10&10%
Reading's Gravity.....75&10@75&10&5%
Shepard's
Noiseless.....75&10%
Niagara.....80%
Buffalo.....80%
Clark's Genuine Pattern.....80%
O. S., Lull & Porter.....75&10%
Acme, Lull & Porter.....75%
Queen City Reversible....70&10&5@75%
Clark's Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3.....75&10@2½%
North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%

Gate Hinges—

Western.....₱ doz $4.40, 60%
N. E.....₱ doz $7.00, 55%
N. E. Reversible.....₱ doz $5.20, 55&10%
Clark's, Nos. 1, 2, 3.....60&10&5%
N. Y. State.....₱ doz $5.00, 55&10%
Automatic.....₱ doz $12.50, 50%
Common Sense.....₱ doz pair $4.50, 50%
Seymour's.....45&10%
Shepard's.....60&10&5%
Reed's Latch and Hinges. ₱ doz $12.00, 50%

Spring Hinges—

Union Spring and Blank Butts.....40%
Gear's Spring Hinge Co.'s list, March 1886.....20%
Acme.....30%
J. S.....25&10%
Empire and Crown.....20%
Hero and Monarch.....55%
American, Gem, and Star.....20%
Oxford.....20%
Barker's Double Acting.....25%
Union Mfg. Co.....25%
Bommer's.....30%
Buckman's.....15@20%
Chicago.....30%
Wiles'.....10%
Devore's.....40%
Rex.....40%
Royal.....60%
Reliable.....60%
Champion.....60%
Bardsley's Patent.....40%
Stearn's.....50&10%

Wrought Iron Hinges

Strap and T.....75&10%
Screw Hook and Strap..... { 6 to 12 in., ₱ ℔ .4 2-10¢ / 14 to 20 in., ₱ ℔ .3 7-10¢ / 22 to 36 in., ₱ ℔ .3 2-10¢
Heavy Welded Hook..... { 6 to 12 in., ₱ ℔ .4 2-10¢ / 14 to 20 in., ₱ ℔ .3 7-10¢ / 22 to 36 in., ₱ ℔ .3 2-10¢
Screw Hook and Eye { ⅛ in., ₱ doz $1.50 / ⅜ in., ₱ doz $2.45 / ¾ in., ₱ doz $3.80 } 10%
Rolled Blind Hinges, Nos. 32 and 34 50&10%
Rolled Blind Hinges, Nos. 232 and 234 55&10%
Rolled Plate.....70&10%
Rolled Raised.....70&10%
Plate Hinges "Providence" { 8, 10 & 12 in., ₱ ℔.....5¢ / over 12 in., ₱ ℔. ...4¢

Hoes—

Eye—

D. & H. Scovil.....20%
Lane's Crescent Planters Pattern..45&5%
Lane's Razor Blade, Scovil Pattern...30%
Maynard, S. & O. Pat.....45&5%
Sandusky Tool Co.,S. & O. Pat. / Am. Axe and Tool Co., S. & O. Pat. } 50&10&5 @60%
Chattanooga Tool Co., S. & O. Pat..60& 5@60&10%
Grub.....60&10%

Handled—

Garden, Mortar, &c.....70%
Planter's, Cotton, &c.....70%
Warren Hoe.....60%
Magic.....₱ doz $4.00

Hog Rings and Ringers—See Rings and Ringers.

Hoisting Apparatus—See Machines, Hoisting.

Hollow-Ware—See Ware, Hollow.

Holders.

Bag.

Sprengle's Pat.....₱ doz $18.....60%

Bit.

Extension,
Barber's, ₱ doz $15.00.....40@40&10%
Ives, ₱ doz $20.00.....60&5@60&10%
Diagonal.....₱ doz $24.00, 40%
Angular.....₱ doz $24.00, 40&5%

File and Tool—

Bals Pat.....₱ doz $4.00; 25%
Nicholson File Holders.....20%
Dick's Tool Holder.....20%

Hooks—

Cast Iron—

Bird Cage, Sargent's list.....
Bird Cage, Reading.....
Clothes Line, Sargent's list..
Clothes Line, Reading list. 60&10@60&10&10%

Ceiling Sargent's list.....55&10&10%
Harness, Reading list..55&10@55&10&10%
Coat and Hat, Sargent's list. 55&10@60&10%
Coat and Hat, Reading.50&10@50&10&10%

Wrought Iron—

Cotton.....₱ doz $1.25
Cotton Pat. (N.Y. Mallet & Handle W'ks). 30%
Tassel and Picture (T. & S. Mfg. Co.)..50%
Wrought Staples, Hooks, &c. See Wrought Goods.

Wire—

Wire Coat and Hat, Gem, list April, 1886.....50%
Wire Coat and Hat, Miles', list April, 1886.....50%
Indestructible Coat and Hat.....45%
Wire Coat and Hat, Standard.....45%
Handy Hat and Coat.....50&10%
Steady Ceiling Hooks.....50&10%
Belt.....80&80&10%
Atlas, Coat and Hat.....60%

Miscellaneous.

Grass, No. 2, $2.00; No. 3, $2.25; No. 4, $2.50
Nolin's Grass.....₱ doz $2.25
Bush.....55@60%
Whiffletree—Patent.....55%
Hooks and Eyes—Malleable Iron. 70@70&10%
Hooks and Eyes—Brass.....60&10&10%
Fish Hooks, American.....50%
Bench Hooks.....See Bench Stops.

Horse Nails—See Nails, Horse.

Horse Shoes—See Shoes, Horse.

Hose, Rubber—

Competition.....75@75&5%
Standard.....60&10&5@60&10&10%
Extra.....50&10@60%
N. Y. B. & P. Co., Paris.....25&5%
N. Y. B. & P. Co., Extra.....40@40&5%
N. Y. B. & P. Co., Dundee....50&10 @ 60%

Huskers—

Blair's Adjustable.....₱ gr $8.00
Blair's Adjustable Clipper...₱ gr 7.00
Hubbard's Solid Steel.....₱ gr 4.50

Indurated Fiber-Ware—See Ware, Indurated Fiber.—

Irons.

Sad—

From 4 to 10, at factory....₱ 100 ℔, $2.30@$2.40
Self-Heating.....₱ doz $9.00 net
Self-Heating, Tailors'...₱ doz $18.00 net
Mrs. Pott's Irons.....40@40&10%
Enterprise Star Irons.....40@40&10%
Cold Handle Sad Irons.....40&10&50%
Ideal Irons new list.50&10@50 & 10&10%
Salamander, Irons.....25&10%
B. B. Sad Irons, ₱ ℔.....3 @3¼¢
Combined Fluter and Sad Iron, ₱ doz, $15.00.....15%
Fox Reversible, Self-Fluter ₱ doz $24.00
Chinese Laundry (N.E. Butt Co.) 8½¢, 15%
New England.....8¢, 15%
Mahony's Troy Pol. Irons.....25%
Sensible.....20@20&5%
National Self-Heating.....30%

Soldering—

Soldering Coppers.....₱ ℔ 22 @ 23¢
Covert's Adjustable, list Jan. 1, 1886. 35&2%

Irons, Pinking, per doz., 65¢.

Jack Screws—See Screws.

Jacks, Wagon.

Daisy.....33⅓%
Victor.....33⅓%

Kettles—

	Spun.	Stamped.
Brass, 7 to 17 in., ₱ ℔....	24¢	22 ¢
Brass larger than 17 in., ₱ ℔.....	26¢	24½¢

Enameled and Tea—See Hollow-Ware.

Keys—

Lock Asso'n list Dec. 30, 1886...50&10@ 60&5%
Eagle, Cabinet, &c.....33⅓&2%
Hotchkiss' Brass Blanks.....40%
Hotchkiss, Copper and Tinned.....40%
Hotchkiss' Pad. and Cab.....35%
Ratchet Bed Keys.....₱ doz $4.00, 15%
Wollensak Tinned.....50&10%

Knife Sharpeners—See Sharpeners, Knife.

Knives.

Butcher, Shoe, &c—

Wilson's Butcher Knives.....25@30%
Ames' Butcher Knives.....25%
Foster Bros.' Butcher, &c.....40%
Nichols' Butcher Knives.....40&10%
Ames' Shoe Knives.....20@25%
Ames' Bread Knives, ₱ doz $1.50, 15@20%
Moran's Shoe and Bread.....20%
Hay and Straw.....See Hay Knives.
Table and Pocket.....See Cutlery.
Corn, Auburn Mfg. Co. Western Pat., $2.00
Corn, Auburn Mfg. Co. Crescent....$3.50

Corn—

Bradley's.....10%
Wadsworth's.....25%

Drawing—

Withersby.....
P. S. & W.....
Mix.....
New Haven.....
} .75 @ 75&10 %
Merrill.....60&10@60&10&5%
Douglas.....75@75&5%
Watrous.....15&10@25%
L. & I. J. White.....20&5%
Bradley's.....35%
Adjustable Handle.....25@33⅓%
Wilkinson's Folding.....25@25&5%

Hay and Straw—

Lightning..Mfrs'. price ₱ doz $18.00, 25% But jobbers cut this price freely, often selling at $8 @ $8.50.
Wadsworth's.....40&7½@40&10%
Carter's Needle.....₱ doz $11.00@$11.50
Heath's.....₱ doz $13.00@13.50
Auburn Hay, Com. and Spear Point..50%
Auburn, Straw.....40%
Nolin's Hay.....₱ doz.$8.00 @ $9.00

Mincing.

Am. (3d quality), ₱ gr., 1 blade, $7; 2 blades, $12; 3 blades, $18.....net
Lothrop's.....30&10%
Smith's, ₱ doz, Single, $2.00: Double, $3 40&45%
Knapp & Cowles.....50&10@60%
Buffalo Adjustable.....₱ doz $3.00 .25%
Buffalo Double Adj'table. ₱ doz $3.00 25%

Knobs—

Door Mineral.....60@65%
Door Por. Jap'd.....70&75%
Door Por. Nickel.....$2.00@2.25
Door Por. Plated, Nickel.....$2.00@2.25
Drawer, Porcelain.....60&10@60&10&10%
Hemacite Door Knobs.....40&10@50%
Yale & Towne Wood, list Dec., 1885...40%
Furniture Plain.....75¢ gro inch, 10%
Furniture, Wood Screws.....25&10%
Base, Rubber Tip.....70&10&5%
Picture, Judd's.....60&10&10@70%
Picture, Sargent's.....70&10%
Picture, Hemacite.....35&5%
Shutter, Porcelain.....65&10%
Carriage, Jap.....₱ gro 80¢, 60&10%
Bardsley's Wood Door, Shutter, &c..40%

Ladies'—

Melting, Sargent's.....	55&10%
Melting, Reading.....	35&10%
Melting, Monroe's Pat...₱ doz $4.00,	40%
Melting, P. S. & W.....	35&10@40%
Melting, Warner's.....	30%

Lanterns—

Tubular—

Plain with Guards, ₱ doz.....$4.00@4.25
Lift Wire, with Guards.....$4.50@4.75
Square Plain, with Guards.....$4.00@4.25
Sq. Lift Wire, with Guards....$4.25@4.50
Without Guards, 25¢ ₱ doz less.

Miscellaneous.

Police, Small, $6.00; Medium, $7.25; Large, $9.75.....20@25%

Lawn Mowers—See Mowers, Lawn.

Leaders, Cattle.

Humason. Beckley & Co.'s.....70%
Sargent's.....60%&10%
Hotchkiss.....30%
Peck, Stow & W. Co.....60&10%

Lemon Squeezers—See Squeezers, Lemon.

Lifters, Transom.

Wollensak's:
Class 3 and 4, Bronzed Iron.....50%
Class 3 and 4, Bronze Metal.....25%
Class 3 and 4, Brass.....35%
Skylight Lifters.....35%
Crown, Eagle and Shield.....50%
Reiher's, list Aug. 1, 1889
Bronzed Iron Rods.....50&10&10&2%
Brass, Real Bronze or Nickel Plate..30%
Excelsior.....50&10&2%
Shaw's.....50&10%
Payson's:
Universal.....60%
Solid Grip.....60%
Imperial.....50&10%

Lines—

Cotton and Linen Fish, Draper's.....50%
Draper's Chalk.....60%
Draper's Masons' Linen, 84 ft., No. 1, $1.25; No. 2, $1.75; No. 3, $2.25; No. 4, $2.75; No. 5, $3.25.....25%
Cotton Chalk.....55%
Samson, Cotton, No. 4, $2; No. 4½, $2.50; No. 5, $3.....10%
Silver Lake, Braided, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₱ gro.....25%
Mason's Linen, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50.....
Mason's Colored Cotton.....45%
Wire Clothes.. Nos. 12 10 20
100 ft. $4 00 $3 50 $3.00
Ventilator Cord, Samson Braided, White or Drab Cotton..₱ doz $7.50, 20%

Locks, &c.—

Cabinet—

Eagle, Gaylord Parker and Corbin...} List March, '84, rev Jan.1,'85..33⅓&2%
Deitz, Nos. 36 to 39.....40%
Deitz, Nos. 51 to 63.....40&10%
Deitz, Nos. 86 to 96.....30%
Stoddard Lock Co.....30&33⅓%
"Champion" Night Latches.....40%
Barnes Mfg. Co.....40@40&10%
Eagle and Corbin Trunk.....25&2%
"Champion" Cab. and Combin...33⅓%
Yale.....net prices
Romer's.....25%

Door Locks, Latches, &c.

R. & E. Mfg. Co., list Mar.20, 1889..... } 60&10@60 &10&10
Mallory, Wheeler & Co., list July, '88..... } Much lower net prices often made.
Sargent & Co., list Aug. 1, '88
Reading Hardware Co., list Feb. 2, '88.....
Brittan, Graham & Mathes, list Jan. 1890.....60&10&10%
Perkins' Burglar Proof.....60&25%
Plate.....33⅓&2%
Barnes Mfg. Co.....40@40&10%
Yale.....net prices
Deitz Flat Key.....30%
L. & C. Round Key Latches.....30&10%
L. & C. Flat Key Latches.....33⅓&10%
Romer's Night Latches.....15%
Shepardson or U. S.....35%
Seed's N. Y. Hasp Lock.....25%

Padlocks—

List Dec. 23, '84.....75@75&10%
Brittan, Graham & Mathes.....75&10%
Yale Lock Mfg. Co.'s.....net prices
Eagle.....25&2%
Eureka, Eagle Lock Co.....40&2%
Romer's, Nos. 0 to 91.....30%
Romer's Scandinavian, &c., Nos. 100 to 505..15%
A. E. Deitz.....40%
Champon Padlocks.....40%
Hotchkiss.....30%
Star.....45%
Horseshoe.....₱ doz, $9. 40@40&10%
Barnes Mfg. Co.....40@40&10%
Nock's.....30%
Brown's Pat.....25%
Scandinavian.....90@90&10%
E. T. Fraim's Keystone Scandavian: Nos. 119, 120, 130 and 140.....90&10%
Other Nos.....55%
Ames Sword Co. up to No. 150.....40%
Ames Sword Co. above No. 150.....50%
Slaymaker Barry & Co.
No. 41 line.....45&5%
No. 31 line.....60&5%
No. 21 line.....75@5%

Sash, &c.

Clark's, No. 1, $10; No. 2, $8 ₱ gr..33⅓%
Ferguson's.....33⅓%
Morris and Triumph, list Aug. 16, 1886. 60&2%
Victor.....60&10&2%
Walker's.....10%
Attwell Mfg. Co.....25&33⅓%
Reading.....60%&10@60%&10&10%
Hammond's Window Springs.....40%
Common Sense, Jap'd, Copp'd and Br'zed.....₱ gr $4.00
Common Sense, Nickel Plated ₱ gr $10.00
Universal.....30%
Kempshall's Gravity.....60%
Kempshall's Model.....60@60&10%
Corbin's Daisy, list Feb. 15, 1886.....70%
Payson's Perfect.....60@60&10%
Hugunin's Sash Balances.....25&5&2%
Hugunin's New Sash Locks.....25&5&2%
Stoddard "Practical".....10%
Ives' Patent.....60&10@60&10&5%
Liesche's, Nos. 100 and 110, ₱ gr $5; 105, $10.00.....20&10%
Davis, Bronze, Barnes Mfg. Co.....50%
Champion Safety, list March 1, 1888 55@55&5%
Security.....70%
Buckeye.....₱ gro $4.80

Lumber Tools—See Tools, Lumber

Lustre—

Four-ounce Bottles....₱ doz, $1.75; ₱ gross.....$17.00

Machines.

Boring—

	Without Augers.	Upright.	Angular.
Douglas.....	$5.50	$6.75	.....50%
Snell's, Kice's Pat.	5.50	6.75	.40&10&10
Jennings.....	5.50	6.75	.40&10&10
Other Machines.	2.35	2.75	.....
Phillips' Patent with Augers...	7.00	7.50	...

Fluting.

Knox, 4½-inch Rolls.....$3.25 each } 35%
Knox, 6-inch Rolls.....$3.60 each }
Eagle, 3½-inch Roll, $2.15.....35%
Eagle, 5½-inch Roll, $2.85.....35%
Crown, 4½ in., $3.50; 6 in., $4.00; 8 in., $6.50 each.....35%
Crown Jewel, 6 in.....$3.50 each, 35%
American, 5 in., $3.00; 6 in., $3.40; 7 in., $4.50 each.....35%
Domestic Fluter.....each, $1.50
Geneva Hand Fluter, White Metal ₱ doz $12, 25%
Crown Hand Fluter, Nos. 1, $15.00; $12.50; 3, $10.00.....30%
Shepard Hand Fluter, No. 85 ₱ doz $15.00.....40

Shepard Hand Fluter, No. 110 ₱ doz $11.00 ..... 40%
Shepard Hand Fluter, No. 95 ₱ doz $8.00 ..... 40%
Clark's Hand Fluter, ₱ doz $15.00 ..... 35%
Combined Fluter and Sad Iron, ₱ doz $15.00 ..... 30%
Buffalo ..... ₱ doz $10.00 ..... 10%

Hoisting—
Moore's Hand Hoist, with Lock Brake 20%
Moore's Differential Pulley Block 40%
Energy Mfg. Co's 25%

Mallets.

Hickory ..... 20&10@20&10&10%
Lignumvitæ ..... 20&10@20&10&10%
B. & L. Block Co., Hickory & L. V. ..... 30@30&10%

Mattocks. Regular list ..... 60&10%

Measures—
Standard Fiberware, No. 1, peck, ₱ dozen, $4; ½-peck, $3.50.

Meat Cutters—See Cutters, Meat.

Mills.

Coffee—
Box and Side, List Jan. 1, 1888 ..... 60&2%
American, Enterprise Mfg Co. ..... 20&10@30%
The Swift, Lane Bros ..... 20&10%

Mincing Knives—See Knives, Mincing.

Molasses Gates—See Gates, Molasses.

Money Drawers—See Drawers, Money.

Mowers, Lawn.

Leading makers ..... 60@60&10&5%
Other makers ..... 60&10&5@60&10&10%
Pennsylvania 60%
Continental 60%
New Model ..... 60&10&5%
New Quaker City ..... 60&10&5%
Great American ..... 60&10&5%

Muzzles—
Safety ..... ₱ doz. $3.00, 25%

Nails.

Cut and Wire. See Trade Report.
Wire Nails, Papered.
Association list, July 15, '89. .75@75&5%
Tack Mfrs.' list ..... 60&10&10%
Wire Nails, Standard Penny.
Card June 1, '89, base ..... $2.70 @ $2.75

Horse—

Nos.	6	7	8	9	10	
Ausable	.28	26	25	24	23	40&5&2%
Clinton, Fin						11
Essex	.28	26	25	24	23	25&10@25&10&10%
Lyra	.25	23	22	21	20	40&10&5@50%
Snowden	25	23	22	21	20	40&10&5@50%
Putnam	.23	21	20	19	18	1000 ℔ in year 15%
Vulcan	.23	21	20	19	18	.12½&5%
Northwest'n	.25	23	22	21	20	25@25&5%
Globe	.23	21	20	19	18	.25&10%
Boston	.23	21	20	19	18	20&5&5&2½%
A. C	.25	23	22	21	20	25&10@33⅓&5%
C. B.-K	.25	23	22	21	20	25&10@33⅓&5%
Champlain	.28	6	25	24	23	25&10&10%
New Haven	.28	26	25	24	23	25&10@25&10&10%
Saranac	.23	21	20	19	18	.30&10%
Champion	.25	23	22	21	20	10&10&10%
Capewell	.28	26	5	24	23	35&5@35&10%
Star	.23	21	0	19	18	10&10&10&12½%
Anchor	.23	21	20	19	18	.35%
Western	.23	21	20	19	18	.40&10%
Empire Bronzed						14 ₱ ℔.

Picture—
Brass Head, Sargent's list ..... 50&10&10%
Brass Head, Combination list ..... 50&10%
Porcelain Head, Sargent's list .. 50&10&10%
Porcelain Head, Combination list .. 40&10%
Niles' Patent 40%

Nail Pullers.—See Pullers, Nail.

Nail Sets.—See Sets, Nail.

Nut Crackers.—See Crackers, Nut.

Nuts—
Nuts, off list Dec. 18, 1889: Square. Hex.
Hot Pressed ..... 5.45¢ 6.00¢
Cold Punched ..... 5.00¢ 4.90¢
In lots less than 100 ℔, ₱ ℔, add ½¢; 1-lb boxes, add 1¢ to list.

Oakum—
Government ..... ₱ ℔ 7@7¼¢
U. S. Navy ..... ₱ ℔ 6@6¼¢
Navy ..... ₱ ℔ 5¼@5½¢

Oilers—
Zinc and Tin ..... 65@65&10%
Brass and Copper ..... 50&10@50&10&5%
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4.00; No. 3, $4.40 ₱ doz. 10@10&5%
Malleable, Hammers, Old Pattern, same list 40%
Prior's Pat. or "Paragon" Zinc ..... 60&10&10%
Prior's Pat. or "Paragon" Brass 50%
Olmstead's Tin and Zinc 60%
Olmstead's Brass and Copper 50%
Broughton's Zinc 60%
Broughton's Brass 50%
Gem P. D. & Co. ..... ₱ gro. $2
Steel, Draper and Williams 50%

Openers, Can.

Messenger's Comet ..... ₱ doz $3.00, 25%
American ..... ₱ gross $3.00
Duplex ..... doz 25¢, 15@20%
Lyman's ..... ₱ doz $3.75, 20%
No. 4 French ..... ₱ doz $2.25, 55@60%
No. 5, Iron Handle ..... ₱ gr $6.00, 45&50%
Eureka ..... ₱ doz $2.50, 10%
Sardine Scissors ..... ₱ doz $2 75@3.0.
Star ..... ₱ doz $2.7
Sprague, No. 1, $2.00 2, $2.25; 3, $2.50 50&10&10%
Excelsior, No. 1, $2.50; No. 2, $1.50 ..40%
World's Best, ₱ gross, No. 1, $12.00 No. 2, $24.00; No. 3, $36.00 ..... 5%&10%
Universal, ₱ doz $3.00 ..... 40&5%
Domestic, ₱ doz $2.50 ..... 40%
Champion ₱ doz $2.00 ..... 50%

Packing, Steam—
Rubber—

Standard ..... 60&5@65%
Extra ..... 50@50&5%
N. Y. B. & P. Co., Standard .. 40&10@50%
N. Y. B. & P. Co., Empire ..... 60&5@65%
N. Y. B. & P. Co., Salamander. ₱ ℔ 65¢, 10@15%
Jenkins' Standard, ₱ ℔ 80¢, .. 25@25&5%

Miscellaneous—
American Packing ..... 10¢@11¢ ₱ ℔
Russia Packing ..... 14¢ ₱ ℔
Italian Packing ..... 13¢@14¢ ₱ ℔
Cotton Packing ..... 15¢@17¢ ₱ ℔
Jute ..... 7¢@8¢ ₱ ℔

Padlocks—See Locks.

Pails.

Galvanized Iron—

	Quarts	10	12	14	Decr'd
Hill's Light Weight, ₱ doz.	$2.75	3.00	3.25		
Hill's Heavy Weight, ₱ ds.	3.00	3.25	3.75		
Helwig's	2.75	3.00	3.25		
Sidney Shepard & Co.	2.35	2.85	3.05		
Iron Clad	2.50	2.75	3.00		
Fire Buckets	2.75	3.25	3.50		
Buckets, see Well Buckets.					
Indurated Fibre Ware—25%					
Star Pails, 12 qt					₱ doz $6.00
Fire, Stable and Milk, 14 qt					₱ doz $7.80
Standard Fibre Ware—					
Water Pails, 12 qt., per doz.					$4.00 $4.50
Dairy Pails, 14 qt., per doz.					4.50 5.00
Fire Pails, No. 1, 12 qt. per doz					4.50
Fire Pails, No. 2, 14 qt. per doz					5.00
Sugar Pails					6.00 6.50
Horse Pails					5.50
Buggy Pails					4.00
Slop Jars (bal. trap)					8.00 9.00
Chamber Pails, 14-qt					6.50 7.50

Pans.

Dripping.
Small sizes ..... ₱ ℔ 6¼¢
Large sizes ..... ₱ ℔ 5¾¢

Fry—
Standard List:

No.	0	1	2	3	4
₱ doz.	$3.00	$3.75	$4.25	$4.75	$5.25
No.	5	6	7	8	
₱ doz.	$6.00	$7.00	$8.00	$9.00	

Polished, regular goods ..... 70&10%
Acme Fry Pans ..... 60&10%

Paper and Cloth—

Sand and Emery—
List April 19, 1886 ..... 50@50&10%
Sibley's Emery and Crocus Cloth 30%

Parers.

Apple.

Advance	₱ doz	$4.75
Baldwin	₱ doz	5.25
Bonanza	each	5.00
Champion	₱ doz	7.25
Daisy	₱ doz	4.00
Dandy	each	7.50
Eureka, 1888	each	16.00
Family Bay State	₱ doz	12.00
Favorite	₱ doz	5.00
Gem	₱ doz	5.25
Gold Medal	₱ doz	4.00
Ideal	₱ doz	4.00
Improved Bay State	₱ doz	27.00 @ 30.00
Little Star	₱ doz	4.50
Monarch	₱ doz	13.50
New Lightning	₱ doz	5.50
Oriole	₱ doz	4.00
Penn	₱ doz	4.00
Perfection	₱ doz	4.00
Pomona	₱ doz	4.00
Rocking Table	₱ doz	6 00
Turntable	₱ doz	4.50
Victor	₱ doz	13.50
Waverly	₱ doz	4.00
White Mountain	₱ doz	4.00
72	₱ doz	4.25
76	₱ doz	5.75
78	₱ doz.	6.50

Potato—

White Mountain	₱ doz	$4.50
Antrim Combination	₱ doz	$5.50
Hoosier	₱ doz	$13.50
Saratoga	₱ doz	$5.50

Pencils—

Faber's Carpenters' ..... high list 50%
Faber's Round Gilt ..... ₱ gro $5.25
Dixon's Lead ..... ₱ gro $4.50
Dixon's Lumber ..... ₱ gro $6.75
Dixon's Carpenters' ..... 40&10%

Picks—

Railroad or Adze Eye, 5 to 6, $12.00; 6 to 7, $13.00 ..... 60&10%

Picture Nails.—See Nails, Picture.

Pinking Irons.—See Irons, Pinking.

Pins.

Bow—
Humason, Beckley & Co.'s ..... 60&10%
Sargent & Co's ..... $17 and $18 ..... 60&10%
Peck, Stow & W. Co. ..... 50&10@50&10&5%

Curtain—
Silvered Glass ..... net
White Enamel ..... net

Escutcheon,
Iron, list Nov. 11, 1885 .. 50&10@50&10&5%
Brass ..... 60@60&5%

Pipe, Wrought Iron—
List September 18, 1889.
1¼ and under, Plain 47½%
1¼ and under, Galvanized 40%
1½ and over, Plain 60%
1½ and over, Galvanized 47½%
Boiler Tubes, Iron.
1¾ and under 45%
2 to 4 inch 50%
4-inch and larger 52½%

Planes and Plane Irons—

Wood Planes—
Molding ..... 40&2%
Bench, First Quality ..... 55&2%
Bench, Second Quality ..... 60&2%
Bailey's (Stanley R. & L. Co.) ..... 40&10%

Iron Planes—
Bailey's (Stanley R. & L. Co.) ..... 40&10@40&10&10%
Miscellaneous Planes (Stanley R. & L. Co.) ..... 20&10@20&10&10%
Victor Planes (Stanley R. & L. Co.) ..... 20&10@20&10&10%
Steer's Iron Planes ..... 35@35&10%
Meriden Mal. Iron Co.'s ..... 40@40&10%
Davis's Iron Planes ..... 40@40&10%
Birmingham Plane Co. ..... 50@50&10%
Gage Tool Co.'s Self-Setting ..... 30&10&10%
Chaplin's Iron Planes ..... 40@40&10%
Sargent's ..... 30&10@30&10&10%
Standard Tool Co. ..... 50@50&5%

Plane Irons—
Butcher's ..... $5.00@$5.25 to 2
Buck Bros 30%
Auburn "Thistle" ..... } 35&2%
Ohio ..... }
Sandusky ..... }
S. & I. J. White 25%

Plates.

Felloe ..... ₱ ℔ 6¢@6¼¢

Pliers and Nippers—

Button's Patent ..... 50@50&10%
Hall's No. 2, 5 in., $13.50; No. 4, 7 in. $21.00 ₱ doz ..... 20&10@33⅓%
Humason & Beckley Mfg. Co. .. 50@50&10%
Gas Pliers 60%
Gas Pliers, Custar's Nickel Plated .. 60&5%
Eureka Pliers and Nippers 40%
Russell's Parallel 25%
P. S. & W. Cast Steel 50%
P. S. & W. Tinners' Cutting Nippers, add 6% dis 10%
Carew's Pat. Wire Cutters 20%
Morrill's Parallel, ₱ doz. $12.00 .. 30&5%
Cronk's 8 in., $15.00; 10 in. $21.00, 40@40&5%

Plumbs and Levels—

Regular List ..... 70&10@70&10&10%
Disston's 50%
Pocket Levels ..... 70&10@70&10&10%
Davis Iron Levels 30%
Davis' Inclinometers ..... 10&10%

Poachers.

Egg.
Buffalo Steam Egg Poachers, ₱ doz, No. 1, $6.00; No. 2, $9.00 ..... 25%

Pokes, Animal—

Bishop's I. X. L.	₱ doz	$6.00
Bishop's O. K.	₱ doz	$5.25
Bishop's Pioneer	₱ doz	$3.75
Bishop's American	₱ doz	$2.75
Eagle, Double Stale	₱ doz	$5.75
Eagle, Single Stale	₱ doz	$3.75
Buckeye, Single Stale	₱ doz	$2.75

Police Goods.

R. I. Tool Co., Handcuffs, $15.00 ₱ doz 10%
R. I. Tool Co., Leg Irons, $25.00 ₱ doz 10%
Tower's 25%
Daley's Improved Handcuffs: 2 Hands, Polished, ₱ doz $48.00; Nickeled, $57.00: 3 Hands, Polished, ₱ doz $72.00: Nickeled, $84.00 ..... 25%
J. P. Lovell's Police Goods 25%

Polish, Metal.

Prestoline 30%
Prestoline Paste 33⅓%
Gaston's Silver Compound 33⅓%

Polish. Stove.

Joseph Dixon's	₱ gro	$6.00, 10%
Gem	₱ gro	$4.50, 10%
Gold Medal	₱ gro	$6.00, 25%
Mirror	₱ pro	$6.00, —%
Lustro	₱ gro	$4.75
Ruby	₱ gro	$3.75
Rising Sun, 5 gro lots	₱ gro	$5.50

Dixon's Plumbago ..... ₱ ℔ 8¢
Boynton's Noon Day, ₱ gro 13.00
Parlor Pride Stove Enamel .. ₱ gro $ cans
Yates' Liquid, 2 3 5 10 gal. ... 8¢ ₱ gal ... $0.90 .80 .70 .60
Yates Standard Paste Polish, 10-℔ cans, ₱ ℔ 15¢

Jet Black	₱ gro	$3.50
Japanese	₱ gro	$3.50
Fireside	₱ gro	$2.50
Diamond O. K. Enamel	₱ gro	$19.00
Bonnell's Liquid Stove Polish	₱ gro	$9.00
Bonnell's Paste Stove Polish	₱ gro	$6.00

Black Eagle Benzine Paste, 5 and 10 ℔ cans ..... 12½¢
Black Jack Water Paste, 5 and 10 ℔ cans ..... 12½¢
Nickel Plate Paste ..... ₱ gro $6.00

Poppers, Corn—

Round or Square, 1 qt. ₱ gr $10.00@10.50
Round or Square, 1½ qt. ₱ gr $15@15.50
Round or Square, 2 qt. ₱ gr $18.50@19.00

Post Hole and Tree Augers and Diggers—See Diggers, Post Hole, &c.

Potato Parers—See Parers, Potato.

Pots.

Glue—
Tinned 40%
Enameled ..... 40&2%
Family, Howe's "Eureka" 40%
Family, L. F. C.'s "Handy" 50%

Presses.

Fruit and Jelly—
Enterprise Mfg. Co. ..... 20&10@30%
Henis ..... ₱ doz $3.50
Shepard's Queen City 40%

Pruning Hooks and Shears.—See Shears.

Pullers.

Nail.
Curtiss Hammer ..... ₱ doz $9.00
Giant, No. 1 ..... ₱ doz. $13.00, 10%
Giant, No. 2 ..... ₱ doz, $15.00, 10%
Pelican ..... ₱ doz, $9.00, 25%

Pulleys—
Hot House, Awning, &c. ..... 60&10%
Japanned Screw ..... 60&10%
Brass Screw ..... 60&10%
Japanned Side ..... 66⅔&10%
Japanned Clothes Line ..... 60&10%
Empire Sash Pulley ..... 55@60%
Moore's Sash, Anti-Friction 50%
Hay Fork, Solid Eye, $4.00; Swivel, $4.50 ..... 50&10@50&10&5%
Hay Fork, "Anti-Friction," 5 in. Solid, $5.70 ..... 50%
Hay Fork, "F" Common and Pat. Bushed 20%
Hay Fork, Tarbox Pat. Iron 20%
Hay Fork, Reed's Self-Lubricating ... 60%
Shade Rack 45%
Tackle Blocks ..... See Blocks
Moore's Anti-Friction 5 in. Wheel, ₱ doz $12.00 40

Pumps—
Cistern, Best Makers ..... 60@60&10%
Pitcher Spout, Best Makers ..... 67½@70%
Pitcher Spout, Cheaper Goods. 70@70&5%

Punches—
Saddlers' or Drive, good, ₱ doz ... 60@65%
Bemis & Call Co.'s Cast Steel Drive .. 50&5%
Bemis & Call Co's Springfield Socket .. 50&5%
Spring, good quality ... ₱ doz $2.50@2.60
Spring, Leach's Pat 15%
Bemis & Call Co.'s Spring and Check .. 40%
Solid Tinners', P.S. & W. Co., ₱ doz $1.44, 55%
Tin'rs' Hollow Punches P.S. & W. Co. 20&2%
Rice Hand Punches 15%
Avery's Revolving 40%
Avery's Saw-Set and Punch. See Saw Sets.

Rail—

Sliding Door. Wr't Brass, ₱ ℔ 35¢ 15%
Sliding Door, Bronzed Wr't Iron .. ₱ ft. 7¢
Sliding Door, Iron, Painted, ₱ foot 4¢, 40%
Barn Door Light. In. ½ ¾ 1
Per 100 feet $2.00 2.50 3.10, 10%
B. D. for N. E. Hangers—

	Small.	Med.	Large.	
Per 100 feet	$2.15	2.70	3.25	net
Terry's Steel Rail, ₱ foot				4½¢
Victor Track Rail, 7¢ ₱ foot				50&2%
Carrier Steel Rail, ₱ foot				4½¢
Moore's Wrought Iron				25%

Rakes—
Cast Steel, Association goods 70%
Cast Steel, outside goods 60&10&10@70&5%
Malleable ..... 70@70&5%
Gibbs Lawn Rake ..... $12.00, 50&15
Canton Lawn Rake ..... $9.00, 50&10
Ft. Madison Prize Bow Brace and Peerless 60%
Fort Madison Steel Tooth Lawn Rake, $6.00 ..... 25%

Razors—
J. R. Torrey Razor Co 20%
Wostenholme and Butcher, $10.00 to 2, 10%
Jordan's AA A1, list Nov. 1, 1889 ..... 50%
Jordan's Old Faithful, list Nov. 1, '89 .50%
Electric ..... List net

Razor Strops—See Strops, Razor.

Rings and Ringers.

Bull Rings—
Union Nut Co. 55%
Sargent's ..... 60%&10@70&5%
Hotchkiss' low list 30%
Humason, Beckley & Co.'s ..... 70&10%
Peck, Stow & W. Co's .. 50&10@50&10&10%
Elkrich Hdw. Co., White Metal, low list. 50@50&10%

Hog—

Top of the Hill Ringers	₱ doz	$2.00
Top of the Hill Rings	₱ doz	$1.25
Hill's Improved Ringers	₱ doz	$4.25
Hill's Old Style Ringers	₱ doz	$2.75
Hill's Tongs	₱ doz	$4.50
Hill's Rings	₱ doz bxs	$2.15@2.25
Perfect Rings	₱ doz bxs	$1.60@1.70
Perfect Ringers	₱ doz	$2.15@2.25
Blair's Hog Ringers	₱ doz	$2.25@2.50
Blair's Hog Rings	₱ doz	90¢@$1.00
Champion Ringers	₱ doz	$2.00
Champion Rings, Double	₱ doz	$2.25
Brown's Ringers	₱ doz	$2.00
Brown's Rings	₱ doz	$1.25@1.30

Rivets and Burrs—
Iron, list Nov. 17, '87 ..... 40%
Copper ..... 50&10%
Coppered Iron, Bettina Brand 40%

Rivet Sets—See Sets.

Rods—
Stair, Brass ..... 25&2%
Stair, Black Walnut ..... ₱ doz 40¢

Rollers—
Barn Door, Sargent's list ..... 60&10&10%
Acme Moore's Anti-Friction 55%
Union Barn Door Roller 70%

Rope—
Manufacturers' prices:

Manila .. ½ in. and larger	₱ ℔	15 ¢
Manila ..... ⅝ in.	₱ ℔	13½¢
Manila ..... ¼ and 5-16 in.	₱ ℔	15½¢
Manila Tarred Rope	₱ ℔	14½¢
Manila, Hay Rope	₱ ℔	15 ¢
Sisal .. ½ inch and larger	₱ ℔	10½¢
Sisal ..... ⅝ in.	₱ ℔	11 ¢
Sisal ..... ¼ and 5-16 in.	₱ ℔	11½¢
Sisal, Hay Rope	₱ ℔	10½¢
Sisal, Tarred Rope	₱ ℔	10 ¢
Sisal, Medium Lathe Yarn	₱ ℔	9½¢

1% for cash in 10 days.

New Zealand .. ½ in. and larger	₱ ℔	9½¢
New Zealand ..... ⅝ inch,	₱ ℔	9½¢
New Zealand, ¼ and 5-16 inch,	₱ ℔	10 ¢
New Zealand, Hay Rope	₱ ℔	9½¢
New Zealand, Tarred Rope	₱ ℔	8½¢

Cotton Rope ..... ₱ ℔ 15@18¢ net
Jute Rope ..... ₱ ℔ 7½¢

Wire—
List May 1, 1886.
Iron ..... 32½&2½%
Iron, Galvanized ..... 40&2½%
Cast Steel ..... 40&2½%

Rules—
Boxwood ..... 80&10&10@80&10&10&5%
Ivory ..... 50@50&10%
Starrett's Rules and Straight Edges, Steel ..... 25&10%

Sad Irons—See Irons, Sad.

Sand and Emery Paper and Cloth—See Paper and Cloth, Sand and Emery.

Sash Cord—See Cord, Sash.

Sash Locks—See Locks, Sash.

Sash Weights—See Weights, Sash.

Sausage Stuffers or Fillers—See Stuffers or Fillers, Sausage.

Saws—
Disston's Circular 45%
Disston's Cross Cuts 45%
Disston's Hand 20%
Woodrough & McParlin.
Hand, Panel and Rip 25%
Narrow Champion Cross Cuts with Handles, ₱ foot ..... 20¢
Champion Thin Back Cross Cuts, ₱ foot ..... 23¢
Champion Extra Thin Back Cross Cuts, ₱ foot ..... 31¢
One Man Champion Cross Cuts, ₱ foot ..... 40¢
Wheeler, Madden & Clemson Mfg. Co.
Hand, Panel and Rip 30%
Narrow Champion Cross Cuts with Handles, ₱ foot ..... 20¢
Champion Thin Back Cross Cuts, ₱ foot ..... 28¢
Champion Extra Thin Back Cross Cuts, ₱ foot ..... 31¢
One Man Champion Cross Cuts, ₱ ft. 40¢

Atkins' Circular Shingle and Heading ..... dis 50%
Atkins' Silver Steel Diamond X Cuts ..... ₱ foot 70¢
Atkins' Special Steel Dexter X Cuts ..... ₱ foot 50¢
Atkins' Special Steel Diamond X Cuts ..... ₱ foot 32¢
Atkins' Champion and Electric Tooth X Cuts ..... ₱ foot 30¢
Atkins' Hollow Back X Cuts. ..₱ foot 20¢
Atkins' Mulay, Mill and Drag 40%
Atkins' One-Man Saw, with handles, ₱ foot 40¢
Peace Circular and Mill 45%
Peace Hand Panel and Rip 25%
Peace Cross Cuts 45%
Richardson's Circular and Mill 45%
Richardson's X Cuts 45%
Richardson's Hand, &c 25%

Hack Saws—

Griffin's, complete ..... 40&10@50%
Griffin's Hack Saw, Blades ..... 40&10@50%
Star Hack Saws and Blades 25%
Eureka and Crescent 25%

Scroll—

Lester, complete, $10.00 ..... 25%
Rogers, complete, $4.00 ..... 25%
Barnes' Builders' and Cabinet Makers' $15 ..... 25%
Barnes' Scroll Saw Blades 35%

Saw Frames—See Frames, Saw.

Saw Sets—See Sets, Saw.

Saw Tools—See Tools, Saw.

Scales—

Hatch, Counter, No. 171, good quality, ₱ doz $21.00
Hatch, Tea, No. 161 ..₱ doz $6.75@$7.00
Union Platform, Plain ..... $2.10@2.20
Union Platform, Striped ..... $2.20@2.30
Chatillon's Grocers' Trip Scales 50%
Chatillon's Eureka 25%
Chatillon's Favorite 40%
Family, Turnbulls ..... 30@30&10%
Riehle Bros.' Platform 40%

Scale Beams—See Beams, Scale

Scissors, Fluting 45%

Scrapers—

Adjustable Box Scraper (S. R. & L. Co.) $6.50 ..... 30&10%
Box, 1 Handle ..₱ doz $4.00. 10%
Box, 2 Handle ..₱ doz $6.00. 10%
Defiance Box and Ship ..... 20&10%
Foot ..... 50&10@60%
Ship, Common ..... ₱ doz $3.50 net
Ship, R. I. Tool Co 10%

Screen Window and Door Frames—See Frames.

Screw Drivers—See Drivers, Screw.

Screws.

Bench and Hand—

Bench, Iron ..... 55&10@55&10&10%
Bench, Wood, Beech ..... ₱ doz $2.25
Bench, Wood, Hickory ..... 20&10%
Hand, Wood ..... 25&10@25&10&5%
Lag, Blunt Point, list Jan. 1, 1890 ..75&10%
Coach and Lag, Gimlet Point, list Jan. 1, 1890 ..... 75%
Bed ..... 25&5%
Hand Rail, Sargent's ..... 60%&10%
Hand Rail, H. & B. Mfg. Co ..70&10@75%
Hand Rail, Am. Screw Co 75%
Jack Screws, Millers Falls list..50@50&5%
Jack Screws, P. S. & W 35%
Jack Screws, Sargent..60&10@60&10&5%
Jack Screws Stearns' ..... 40@40&10%

Cork—

Humason & Beckley Mfg. Co..40&10@50%
Williamson's ..... 33⅓@33⅓&5%
Howe Bros & Hulbert 35%

Machine—

Flat Head, Iron 55%
Round Head, Iron 50%

Wood—

List March 1, 1889.

Flat Head Iron 50%		
Round Head Iron 40%		
Flat Head Brass 45%		Extra
Round Head Brass 35%		10 @ 10&5 %
Flat Head Bronze 45%		often given
Round Head Bronze ..35%		
Rogers' Drive Screws		....66⅔%

Scroll Saws—See Saws, Scroll.

Scythe Snaths—See Snaths, Scythe.

Sets.

Awl and Tool.

Aiken's Sets, Awls and Tools, No. 20, ₱ doz $10.00 ..... 55&10%
Fray's Adj. Tool Hdls., Nos. 1, $12; 2, $18; 3, $12; 4, $9. ..... 25@25&10%
Miller's Falls Adj. Tool Hdls., Nos. 1, $12. 2, $18. ..... 25%
Henry's Combination Haft...₱ doz $6.50
Brad Sets, No. 42, $10.50; No. 43, $12.50..70&10&5%
Stanley's Excelsior: No. 1, $7.50; No. 2, $4.00; No. 3, $5.50. ..... 30&10%

Nail—

Square ..... ₱ gr., $4.00@$4.25
Round ..... ₱ gr. $3.25
Buck Bros 27½%
Cannon's Diamond Point...₱ gr., $12, 20%

Rivet.

Regular list ..... 50&10%

Saw—

Stillman's Genuine...₱ doz $5.00@7.75, 40&5%
Stillman's Imita ..... ₱ doz $3.25@5.25, 40&5@40&10%
Common Lever ..... ₱ doz $2.00, 40&5%
Morrill's No. 1, $15.00; Nos. 3&4, $24.00. 40&10@50%
Leach's...No. 0, $8.00; No. 1, $15, 15@20%
Nash's ..... 20&10@20&10&10%
Hammer, Hotchkiss $5.50, 10%
Hammer, Bemis & Call Co.'s new Pat. ..... 30&5%
Bemis & Call Co.'s Lever and Spring Hammer ..... 30&5%
Bemis & Call Co.'s Plate 10%
Bemis & Call Co.'s Cross Cut 12½%
Aiken's Genuine ..... $13.00, 50&10%
Aiken's Imitation ..... $7.00, 55&5%
Hart's Pat. Lever 20%
Disston's Star. 25%
Leopold ..... 40&10@50%
Atkin's Lever ..... ₱ doz No. 1, $6.00
Atkin's Criterion ..... ₱ doz No. 1, $6.00
Croissant (Keller), No. 1, $15.00; No. 2, $24.00 ..... 40&10%
Avery's Saw Set and Punch 50%
Chieftain H. R. Co.'s Superior ..... ₱ doz $15, 50%

Sharpeners, Knife.

Parkin s.
Applewood Handles...₱ doz $6.00, 40%
Rosewood or Cocobolo. ₱ doz $9.00, 40%

Shaves, Spoke.

Iron 45%
Wood 30%
Bailey's (Stanley R. & L. Co.) ..... 40&10%
Stearns' ..... 30&10%
Cincinnati ..... 25&10%

Shears—

American (Cast) Iron...75&10@75&10&5%
Barnard's Lamp Trimmers...₱ doz $3.75
Tinners' ..... 20&2%
Seymour's, List, Dec., 1881. 60&10&10@60&10&10&5%
Heinisch's, List, Dec., 1881. 60&10&10@60&10&10&5%
Heinisch's Tailor's Shears 33⅓%
First quality C. S. Trimmers..80@80&10%
Second quality C. S. Trimmers. 80&10@80&10&10%
Acme Cast Shears ..... 10&10%
Diamond Cast Shears 10%
Clipper ..... 10&10%
Victor Cast Shears ..... 75&10@75&10&5%
Howe Bros. & Hulbert, Solid Forged Steel 40%
Chicago Drop Forge & F. Co., Solid Steel Forged 60%
Clauss Shear Co., Japanned 70%
Clauss Shear Co., Nickeled, same list. 60%
Electric ..... List net

Pruning Shears and Hooks.

Disston's Combined Pruning Hook and Saw ..... ₱ doz $18.00, 20&10%
Disston's Pruning Hook, ₱ doz $12.00, 20&10%
E. S. Lee & Co.'s Pruning Tools 40%
Pruning Shears, Henry's Pat, ₱ doz $3.75@4.00 net
Henry's Pruning Shears, ₱ doz $4.25@ 4.50 net
Wheeler, M. & C. Co.'s Combination, ₱ doz $12.00, 20%
Dunlap's Saw and Chisel, ₱ doz $8.50, 30%
J. Mallinson & Co., No. 1, $5.25; No. 2 7.25
P., S. & W. Co 60%

Tinners', &c.—

Shears and Snips (P. S. & W.) ..... 20@25%
Snips, J. Mallinson & Co 33⅓%

Sheaves—

Sliding Door—

M. W. Co., list July, 1888..50&10@60&5%
R. & E., list Dec. 18, 1885 ..... 55&20%
Corbin's list ..... 60&10&2%
Patent Roller ..... 60&10&2%
Patent Roller, Hatfield's 75%
Russell's Anti-Friction, list Dec. 18, 1885 ..... 60&2%
Moore's Anti-Friction 50%

Sliding Shutter—

R. & E. list Dec. 18, 1885 ..... 60&10&2%
Sargent's list ..... 60&10%
Reading list ..... 60&10&10%

Ship Tools—

L. & I. J. White ..... 20&5%

Shoes, Horse, Mule, &c.—

Horse—

Burden's, Perkins', Phœnix, at factory. $4.00

Mule—

Add $1 ₱ keg to above prices.

Ox, Wrought—

Ton lots ..... ₱ ℔ 9¢
1000 ℔ lots ..... ₱ ℔ 9½¢
500 ℔ lots ..... ₱ ℔ 10¢

Shot—

(Eastern prices 2¢ off, cash, 5 days.

Drop, ₱ bag, 25 ℔ $1.45
Drop, ₱ bag, 5 ℔ ..... .34
Buck and Chilled, ₱ 25-℔ bag 1.70
Buck and Chilled, ₱ 5-℔ bag ..... .39

Shovels and Spades—

Ames' Shovels, Spades, &c., list Nov. 1, 1885 ..... 20%
NOTE.—Jobbers frequently give 5@7½% extra on above.
Griffith's Black Iron ..... 50&10%
Griffith's C. S. ..... 60@60&10%
Griffith's Solid C. S. R. R. Goods 20%
Old Colony (Sanford Fork & Tool Co). 35%
St. Louis Shovel Co ..... 20@20&7½%
Hussey, Binns & Co ..... 15@25%
Hubbard & Co ..... 20@20&7½%
Lehigh Mfg. Co ..... 50&10%
Payne Pettebone & Son, list January, 1886 ..... 30%
Remington's (Lowman's Pat.) ..... 30&10@40%
Rowland's, Black Iron ..... 50&10%
Rowland's Steel ..... 60&5@60&10%

Shovels and Tongs—

Iron Head ..... 60&10@60&10&5%
Brass Head ..... 60&10&10%

Sieves—

Mann's Tin Rim ..... 50&25%
Buffalo Metallic, S. S. & Co ..... 50&25%
Shaker (Barler's Pat.) Flour Sifters.... ₱ doz $2.00; ₱ gr $21.60
Electric ..... ₱ gr $21.00
A. & W. Sifters ..... ₱ doz $2.00
Hunter's ..... ₱ doz $2.00
Smith's Adjustable Sifters....₱ doz $2.00
Smith's Adjustable Milk Strainer. ₱ doz $2.00
Smith's Adjustable T. & C. Strainer. ₱ doz. $1.25

Sieves, Wooden Rim—

	Iron.	Plated.
Mesh 18, Nested, ₱ doz..	80¢	$1.00
Mesh 20, Nested, ₱ doz..	95¢	1.10
Mesh 24, Nested, ₱ doz..	$1.15	1.25

Skeins, Thimble—

Western list ..... 75&5@75&10%
Columbus Wrt. Steel. Special net prices
Coldbrookdale Iron Co 60%
Utica P. S. T. Skeins 60%
Utica Turned and Fitted 35%

Slates—

School, by case ..... 50@50&10%

Snaps, Harness, &c.—

Anchor (T. & S. Mfg. Co.) 65%
Fitch's (Bristol) ..... 50&10%
Hotchkiss 10%
Andrews 50%
Sargent's Patent Guarded ..... 70&10&10%
German, new list ..... 40&10%
Covert ..... 50&2%
Covert, New Patent ..... 50&5&2%
Covert, New R. E ..... 60&3%
Covered Spring ..... 60&10&10%

Snaths, Scythe.

List ..... 50&10@50&10&5%

Soldering Irons—See Irons, Soldering.

Spittoons, Cuspidors, &c.

Standard Fiberware—

Cuspidors, 8½-inch, ₱ doz., No. 5, $8; No. 5X $9.
Spittoons, Daisy, 8-inch, No. 1, $4; 10 and 11 inch, $6.

Spoke Shaves—See Shaves, Spoke.

Spoke Trimmers—See Trimmers, Spoke.

Spoons and Forks—

Tinned Iron—

Basting, Cen. Stamp. Co.'s list ..... 70&10%
Solid Table and Tea, Cen. Stamp. Co.'s list ..... 70&10%
Buffalo S. S. & Co ..... 33⅓&2%

Silver-Plated—(4 mos. or 5% cash 30 days).

Meriden Brit. Co., Rogers ..... 40, 15, 10&5%
C. Rogers & Bros ..... 40, 15, 10&5%
Rogers & Bro ..... 40, 15, 10&5%
Reed & Barton ..... 40&10%
Wm. Rogers Mfg. Co ..... 40, 15, 10, 5&5%
Simpson, Hall, Miller & Co ..... 40, 15, 10&5%
Holmes & Edwards Silver Co ..... 40, 15, 10, 5&5%
L. Boardman & Son 60%

Miscellaneous.

Holmes & Edwards Silver Co.:
No. 67 Mexican Silver ..... 50&10&5%
No. 90 Silver Metal ..... 50&10&5%
No. 24 German Silver ..... 50&10&5%
No. 50 Nickel Silver ..... 50&5%
No. 49 Nickel Silver ..... 50&10&5%
Wm. Rogers Mfg. Co.:
Rogers' Silver Metal ..... 50, 10&6%
18% Rogers' German Silver ..... 60&6%
22% Rogers' Nickel Silver ..... 50&6%
German Silver ..... 50&50&5
German Silver, Hall & Elton..50&5% cash
Nickel Silver ..... 50&5@50&10&5% cash
Britannia 60%
Boardman's Nickel Silver ..... 50&5% cash
Boardman's Britannia Spoons, case lots ..... 60&5% cash

Springs, Door.

Torrey's Rod, regular size....₱ doz $1.80
Gray's, ₱ gr., $20.00 ..... 20%
Bee Rod ₱ gr., $20.00 ..... 20%
Warner's No. 1, ₱ doz, $2.50; No. 2, $3.30 ..... 40&10@50%
Gem (Coil), list April 19, 1886 ..... 10%
Star (Coil), list April 19, 1886 ..... 20%
Victor (Coil) ..... 60@60&10%
Champion (Coil) ..... 60&10@60&10&10%
Philadelphia, 5 in., $5.00; 8 in., $7.75.. %
Cowell's....No. 1, ₱ doz, $18.00; No. 2, $15.00 ..... 50%
Rubber, complete, ₱ doz, $4.50...55&10%
Hercules 50%
Shaw Door Check and Spring..25@30@35%
Elliptic, Concord, Platform and Half Scroll ..... 60@60&5%
Cliff's Bolster Springs 25%

Squares—

Steel and Iron } .....80 &10%
Nickel-Plated } &10%
Try Square and T Bevels...60&10@60&10&10%
Disston's Try Square and T Bevels.....50%
Winterbottom's Try and Miter....30&10%
Starrett's Micrometer Caliper Squares. 25%
Avery's Flush Bevel Squares 40%
Avery's Bevel Protractor 50%

Squeezers.

Fodder.—

Blair's ..... ₱ doz $2.00
Blair's "Climax" ..... ₱ doz $1.25

Lemon—

Porcelain Lined, No. 1....₱ doz $6.00, 25&30%
Wood, No. 2 ..... ₱ doz $3.00, 35%
Wood, Common ..... ₱ doz $1.70@1.75
Dunlap's Improved ..... ₱ doz $3.75, 20%
Sammis....No. 1, $5.00; No. 2, $9; 12, $18 ₱ doz ..... 25&10%
Jennings' Star ..... ₱ doz $2.50
The Boss ..... ₱ doz $2.50
Dean's..Nos. 1, ₱ doz $6.50; 2, $3.35; 3, $1.90; Queen, $2.50
Little Giant ..... 50@50&5%
King ..... 40&5%
Hotchkiss Straight Flash....₱ doz $12.00

Standard Fiber Ware—See Ware, Standard Fiber.

Staples.

Blind—

Barbed, ½ in. and larger ..... ₱ ℔ 7@7½¢
Barbed, ⅝ in ..... ₱ ℔ 8@8½¢
Fence Staples, Galvanized, } Same price
Fence Staples, Plain ..... } as B'rb Wire. See Trd. Rep.

Steelyards ..... 40&10@50%

Stocks and Dies—

Blacksmith's
Waterford Goods ..... 40@40&10%
Butterfield's Goods ..... 40@40&10%
Lightning Screw Plate ..... 25@30%
Reece's New Screw Plates ..... 33⅓&5@40%
Reversible Ratchet 30%
Gardner 25%

Stops, Bench.

Morrill's ..... ₱ doz $9, 50%
Hotchkiss's ..... ₱ doz $5. 10@10&10%
Weston's, No. 1, $10; No. 2, $9.25&10&5%
McGill's ..... ₱ doz $3 ..... 10%
Cincinnati ..... 25&10%

Stone—

Hindostan No. 1, 3¢; Axe, 3½¢; Slips No. 1, 4½¢
Sand Stone ..... ₱ ℔ 2½¢
Washita Stone, Extra ..... ₱ ℔ 20@21¢
Washita Stone, No. 1 ..... ₱ ℔ 15@16¢
Washita Stone, No. 2 ..... ₱ ℔ 11@12¢
Washita Slips, No. 1, Extra..₱ ℔ 37@40¢
Washita Slips, No. 1 ..... ₱ ℔ 25@26¢
Arkansas Stone, No. 1, 4 to 6 in ₱ ℔ $1.50
Arkansas Stone, No. 1, 6 to 9 in ₱ ℔ $1.85
Turkey Oil Stone, 4 to 8 in ..... ₱ ℔ 40¢
Turkey Slips ..... ₱ ℔ $1.00@1.50
Lake Superior, Chase ..... ₱ ℔ 16¢
Lake Superior Slips, Chase...₱ ℔ 31@32¢
Seneca Stone, Red Paper Brand....₱ ℔ 18@20¢
Seneca Stone, High Rounds..₱ ℔ 20@25¢
Seneca Stone, Small Whets..₱ gro $24.00

Stove Polish—See Polish, Stove.

Stretchers, Carpet.

Cast Steel, Polished ..... ₱ doz $2.25
Cast Iron, Steel Points ..... ₱ doz 80¢
Socket ..... ₱ doz $1.75
Bullard's ..... 25@25&10%

Strops, Razor—

Genuine Emerson ..... 60@60&5%
Imitation " ....₱ doz $2.00, 20&10&5%
Torrey's 20%
Badger's Belt and Com ..... ₱ doz $2.00
Lamont Combination ..... ₱ doz $4.00
Jordan's Pat. Padded, list Nov. 1, '89 .50%
Electric ..... List net

Stuffers or Fillers, Sausage—

Miles' "Challenge," ₱ doz $20, 50@50&5%
Perry ..... ₱ doz, No. 1, $15.00; No. 0, $21.00 ..... 50&5@50&10%
Draw Cut No. 4, each $30.00 ..... 20%
Enterprise Mfg. Co ..... 20&10@30%
Silver's ..... 40&10%

Sweepers, Carpet.

Bissell No. 5 ..... ₱ doz $17.00
Bissell No. 7 New Drop Pan..₱ doz $19.00
Bissell, Grand ..... ₱ doz $36.00
Grand Rapids ..... ₱ doz $24.00
Crown Jewel, No. 1, $18.00; No. 2, $19.00; No. 3, $20.00
Magic ..... ₱ doz $15.00
Jewel ..... ₱ doz $17.00
Improved Parlor Queen, Nickeled.. ..... ₱ doz $27.00
Japanned ..... ₱ doz $24.00
Excelsior ..... ₱ doz $22.00
Garland ..... ₱ doz $18.00
Parlor Queen ..... ₱ doz $24.00
Housewife's Delight ..... ₱ doz $15.00
Queen ..... ₱ doz $16.00
Queen, with band ..... ₱ doz $18.00
King ..... ₱ doz $30.00
Weed, Improved ..... ₱ doz $18.00
Hub ..... ₱ doz $16.00
Cog-Wheel ..... ₱ doz $16.00
Conqueror ..... ₱ doz $22.00
Easy ..... ₱ doz $22.00
Monarch ..... ₱ doz $22.00
Goshen ..... ₱ doz $21.00

Tacks, Brads, &c.—

List Oct. 19, 1889. Standard Weights.

Carpet Tacks—
American Iron, Blued 77½%
Am'ican Iron, Tin'd or Cop'd. 77½%
Steel, Plain or Bright 75%
Steel, Tinned or Coppered 75%
Swedes Iron, Blued 75%
Swedes Iron, Tinned or Cop'd..75%
American Iron Cut Tacks 75%
Swedes Ir. Uphol'rs' Tacks, Blued. 75%
Swedes Iron Upholsterers' Tacks, Tinned 77½%
Gimp and Lace Tacks, Blued 75%
Gimp and Lace Tacks, Tinned..77½%
Swedes Iron Basket or Trimmers' Tacks ..... 70&10%
Miners' Tacks 77½%
Bill-Posters' or Railroad Tacks...75%
Bill-Posters' or Railroad Tacks, Tinned 77½%
Copper Tacks 40%
Copper Finish. & Trunk Nails..... 40%
Cigar Box Nails 50%
Zinc Glaziers' Points 50%
Picture-Frame Points 50%
Looking-Glass Tacks 50%
Brush Tacks 60%
Tin-Capped Trunk Nails 60%
Finishing Nails 70%
Trunk and Clout Nails, Black and Tinned 72½%
Common and Patent Brads 70%
Hungarian Nails 70%
Basket and Chair Nails 65%
Leathered Carpet Tacks 40%

Miscellaneous—

Double-Pointed 82½%
Wire Carpet Nails ..... 50&10%
Plymouth Rock Steel Carpet Tacks..25%

Extra 10 @ 10&10 %

Wire Brads & Nails, see Nails, Wire.
Steel-Wire Brads, R. & E. Mfg. Co.'s list.....50&10%

Tapes, Measuring—

American.....33⅓@33⅓&5%
Spring.....40%
Chesterman's, Regular list.....25@30%

Thermometers—

Tin Case.....80@80&10%

Thimble Skeins—See Skeins.

Ties, Bale- Steel

Standard Wire, list.....50&10&5%

Tinners' Shears, &c.—See Shears, Tinners', &c.

Tinware—

Stamped, Japanned and Pieced, list Jan. 20 1887.....70&10@70&10&5%

Tire Benders, Upsetters, &c—
See Benders and Upsetters, Tire.

Tools.

Coopers'—

Bradley's.....20%
Barton's.....20@20&5%
L. & I. J. White.....30&5%
Albertson Mfg. Co.....25%
Beatty's.....30%
Sandusky Tool Co.....30@30&5%
Fhaves, Cincinnati Tool Co.....20%

Lumber.

Ring Peavies, "Blue Line"...₱ doz $20.00
Ring Peavies, Common.....₱ doz $18.00
Steel Socket Peavies.....₱ doz $21.00
Mall. Iron Socket Peavies....₱ doz $19.00
Cant Hooks, "Blue Line"...₱ doz $16.00
Cant Hooks, Common Finish..₱ doz $14.00
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish.....$16.00
Cant Hooks, Mall. Socket Clasp, Common Finish.....₱ doz $14.50
Cant Hooks, Clip Clasp, "Blue Line" Finish.....₱ doz $14.00
Cant Hooks, Clip Clasp, Common Finish.....₱ doz $12.00
Hand Spikes....₱ doz 6 ft., $15.00; 8 ft., $20.00

Pike Poles, Pike & Hook, ₱ doz., 12 ft., $11.50; 14 ft., $12.50; 16 ft., $14.50; 18 ft., $17.50; 20 ft., $21.50.
Pike Poles, Pike only, ₱ doz, 12 ft., $10.00; 14 ft., $11.00; 16 ft., $13.00; 18 ft., $16.00; 20 ft., $20.00.
Pike Poles, not ironed, ₱ doz, 12 ft. $6.00; 14 ft., $7.00; 16 ft., $9.00; 18 ft., $12.00; 20 ft., $16.00.
Setting Poles, ₱ doz, 12 ft., $14.00; 14 ft., $15.00; 16 ft., $17.00
Swamp Hooks.....₱ doz $18.00

Saw.

Atkins' Perfection.....₱ doz $12.00
Atkins' Excelsior.....₱ doz $6.00
Atkins' Giant.....₱ doz $4.00

Tobacco Cutters—See Cutters, Tobacco.

Transom Lifters—See Lifters, Transom.

Traps—

Game—

Newhouse.....40@40&5%
Oneida Pattern.....70&10%
Game, Blake's Patent.....40&10&5%

Mouse and Rat—

Mouse Wood,Choker, ₱ doz holes, 11@12¢
Mouse, Round Wire.....₱ doz $1.50, 10%
Mouse, Cage, Wire.....₱ doz $2.50, 10%
Mouse, Catch-'em-alive....₱ dz $2.50 15%
Mouse, Bonanza.....₱ gr
Mouse, Delusion.....₱ gr
Rat, Decoy.....₱ gr $10.00, 10%
Ideal.....₱ gr $10.00
Cyclone.....₱ gr $5.25
Hotchkiss Metallic Mouse, 5-hole traps, ₱ doz, 90¢; in full cases, ₱ doz....75¢
Hotchkiss Imp. Rat Killer..₱ gro $18.50
Hotchkiss New Rat Killer...₱ gro $16.50
Schuyler's Rat Killer.....₱ gro $15.00

Triers—

Butter and cheese.....25%

Trimmers, Spoke.

Bonney's.....₱ doz $10.00, 50%
Stearns'.....20&10%
Ives', No. 1, $15.00; No. 2, $12.00 ₱ doz. 55&10%
Douglas'.....₱ doz $9.00, 20%
Cincinnati.....25%

Trowels—

Lothrop's Brick and Plastering, 20&10&5@35%
Reed's Brick and Plastering.....15%
Disston's Br'k and Plastering.....25%
Peace's Plastering.....25%
Clement & Maynard's.....20%
Rose's Brick.....15@20%
Brade's Brick.....25%
Worrall's Brick and Plastering.....20%
Garden.....70%

Trucks, Warehouse, &c.—

B. & L. Block Co.'s list, '82.....40%

Tubes, Boiler—

See Pipe.

Twine—

Flax Twine—	BC.	B.
No. 9, ¼ and ⅓ ℔ Balls	26¢	34¢
No. 12, ¼ and ⅓ ℔ Balls	25¢	33¢
No. 18, ¼ and ⅓ ℔ Balls	22¢	32¢
No. 24, ¼ and ⅓ ℔ Balls	22¢	32¢
No. 36, ¼ and ⅓ ℔ Balls	20¢	31¢
No. 264, Mattrass, ¼ and ⅓ ℔ Balls	52@54¢	
Chalk Line, Cotton, ½ ℔ Balls	25¢	
Mason Line, Linen, ⅓ ℔ Balls	55¢	
2-Ply Hemp, ¼ and ⅓ ℔ Balls (Spring Twine)	15⅓¢	
3-Ply Hemp, 1 ℔ Balls	16@16⅓¢	
3-Ply Hemp, 1⅓ ℔ Balls	15@15⅓¢	
Cotton Wrapping, 5 Balls to ℔	15@16¢	
2, 3, 4 and 5-Ply Jute, ½ ℔ Balls	10¢	
Wool	6⅓@6⅓¢	
Paper	13@14¢	
Cotton Mops, 6, 9, 12 and 15 ℔ to doz.	18¢	

Vises—

Solid Box.....50&10@50&10&5%

Parallel—

Fisher & Norris Double Screw.....15&10%
Stephens'.....25&30%
Parker's.....20@25%
Wilson's.....55%
Howard's.....40%
Bonney's.....40&10%
Millers Falls.....40@40&10%
Trenton.....40&5@40&10%
Merrill's.....15@20%
Sargent's.....60&10&10%
Backus and Union.....40%
Double Screw Leg.....15&10%
Prentiss.....20@25%
Simpson's Adjustable.....40%
Moore's.....20%

Saw Filers—

Bonney's, Nos. 2 & 3, $15.00.....40&10%
Stearn's.....33⅓&10@33⅓&10&10%
Stearn's Silent Saw Vises.....33⅓@35%
Sargent's.....60⅔&10%
Hopkins'.....₱ doz $17.50, 10%
Reading.....40&10%
Wentworth.....20&10%
Combination Hand Vises.....₱ gr $42.00
Cowell Hand Vises.....20%
Bauer's Pipe Vises.....10%
Cincinnati.....25&10%

Wagon Boxes—See Boxes, Wagon.

Washer Cutters—See Cutters Washer.

Wagon Jacks—See Jacks, Wagon.

Ware, Hollow, Enameled, &c.

Cast Iron, Hollow—

Stove Hollow-Ware—
Ground.....55&5@60&5%
Unground.....65&10@65&10&5%
White Enameled-Ware—
Maslin Kettles.....60&10&5%
Boilers and Saucepans.....40%
Tinned Boilers and Saucepans.....40%
Rustless Hollow-Ware.....50@50&5%
Gray Enameled-Ware—
Stove.....50%
Maslin Kettles.....60&10&10%
Boilers and Saucepans.....40&5%

Enameled—

Agate and Granite Ware, list Jan. 1, 1889.....33⅓&10%
Ironclad Enameled Ware...dis 33⅓&10%

Kettles—

Galvanized Tea-Kettles—

Inch....	6	7	8	9
Each....	55¢	60¢	65¢	75¢

Standard Fiber—

	Per Dozen. Plain.	Dec'r'd
Wash-Basins, 10½ in.	$2.00	$2.25
Wash-Basins, 12 in.	2.25	2.75
Keelers, 11¼ in.		4.00
Cuspidors.		8.00
Spittoons, "Daisy," 8 in.	4.00	4.50
Peck Measure.	4.00	
Half-peck Measure.	3.50	

See also Pails.

Indurated Fiber—25%

Spittoons, No. 2, ₱ doz.....$9.00
Basins, Ringed, ₱ doz., No. 2, $4.80; No. 3.....$4.20
Washtubs, Nested, Nos. 0, 1, 2 and 3 (4 pieces), ₱ nest.....$7.50
Keelers, Nested, Nos. 1, 2, 3 and 4 (4 pieces), ₱ nest.....$3.70
Butter Bowls 15, 17 and 19-inch (3 pieces), ₱ nest.....$2.25
Liquid Measures, pt., qt., 2 qt. and funnell (4 pieces) ₱ set.....$7.00
Dry Measures, 1, 2, 4, 8 and 16 qts. (5 pieces), ₱ set.....$8 00
See also *Pails.*

Silver Plated, Hollow—
4 mo. or 5 % cash in 30 days.

Reed & Barton, Meriden Britannia Co., Simpson, Hall, Miller & Co., Rogers & Brother.....40&5%
Hartford Silver Plate Co, William Rogers Mfg. Co.....40&5&5%

Washers—

Size	¼	5-16	⅜	½	⅝	¾	1
Washers	6⅝	5½	4½	3½	3	3	3

In lots less than 200 ℔, ₱ ℔, add ¼¢, 5-2 boxes 1¢ to list.

Wedges—

Iron.....₱ ℔ 3½¢
Steel.....₱ ℔ 4 ¢

Weights, Sash—

Solid Eyes.....₱ ton $18@$19

Well Buckets, Galvanized—See Buckets, Well, Galvanized.

Wheels, Well.

8 in., $2.25; 10 in., $2.70; 12 in., $3.25

Wire and Wire Goods—

Iron—

Market.
Br. & Ann., Nos. 0 to 18.....72½%
Cop'd, Nos. 0 to 18.....70%
Galv., Nos. 0 to 18.....62½%
Tin'd, Tinned list Nos. 0 to 18.....62½%
Stone,
Br. and Ann'd, Nos. 16 to 18.....72½%
Bright and Ann'd, Nos. 19 to 26.....75%
Br. and Ann'd, Nos. 27 to 36.....77½%
Tinned.....
Tinned Broom Wire, 18 to 21, ₱ ℔...5½¢
Galvanized Fence, Nos. 8 and 9.....65%
Annealed Fence, Nos. 8 and 9.....75%
Annealed Grape, Nos. 10 to 14.....75%
Brass, list Jan. 18, 1884.....25%
Copper, list Jan. 18, 1884.....25%
Barb Fence.....See Trade Report
Annealed Wire on Spools.....50%
Malin'sSteel and Tin'd on Spools.....50%
Malin's Brass and Cop. on Spools.....40%
Cast Steel Wire.....50%
Stubs' Steel Wire.....$6.00 to $, 30%
Steel Music Wire, Nos. 12 to 30..55¢ ₱ ℔
Picture Wire.....New list 50%
Wire Clothes Lines, see Lines.

Bright Wire Goods—

Standard list.....85%

Wire Cloth and Netting.

Painted Screen Cloth, good quality, ₱ 100 sq. ft., $1.60 @ $1.75
Galvanized Wire Netting.....70&10@75%

Wire Rope—See Rope, Wire.

Wrenches—

American Adjustable.....40%
Baxter's Adjustable "S".....40&10@50%
Baxter's Diagonal.....40&10@50%
Coes' Genuine.....50@55%
Coes' "Mechanics'".....50&10&3%
Girard Standard.....65&10%
Lamson & Sessions' Engineers'..60&10%
Lamson & Sessions' Standard...70&10%
P. S. & W. Agricultural, Girard Agricultural, Lamson & Sessions' Agric'l..75@75&10
Bemis & Call's
Pat. Combination.....35%
Merrick's Pattern.....35%
Brigg's Pattern.....25%
Cylinder or Gas Pipe.....40@55%
No. 3 Pipe.....40&10%
Aiken's Pocket (Bright).....$6.00, 50&10%
The Favorite Pocket.....₱ doz $4.00, 40%
Webster's Pat. Combination.....25%
Boardman's.....20&10%
Always Ready.....25&5%
Alligator.....50%
Donohue's Engineer.....20&10%
Acme, Bright.....50&2%
Acme, Nickeled.....40&2%
Walker's.....55&3%
Diamond Steel.....55&3%
Cincinnati Brace Wrenches.....25&10%
Tafts' Vise Wrench.....55&10&3%

Wringers, Clothes—

List March 11, 1889, 2% cash.

Wrought Goods—

Staples, Hooks, &c., list Jan. 12, 1886.....80&15@85%

PAINTS, OILS AND COLORS.—Wholesale Prices.

Animal and Vegetable Oils.

Linseed, City, raw, per gal.	62	@	64
Linseed, City, boiled	64	@	66
Linseed, Western, raw	58	@	60
Lard, City, Extra Winter	53	@	54
Lard, City, Prime	51	@	52
Lard, City, Extra No. 1	45	@	46
Lard, City, No. 1	42	@	43
Lard, Western, prime	51	@	52
Cotton-seed, Crude, prime	..	@	28
Cotton-seed, Crude, off grades	22	@	26
Cotton-seed, Summer Yellow, prime	..	@	34
Cottonseed, Summer Yellow, off grades	30	@	33
Sperm, Crude	..	@	65
Sperm, Natural Spring	66	@	68
Sperm, Bleached Spring	71	@	73
Sperm, Natural Winter	77	@	76
Sperm, Bleached Winter	78	@	81
Whale, Crude	..	@	46
Whale, Natural Winter	49	@	..
Whale, Bleached Winter	51	@	..
Whale, Extra Bleached	54	@	55
Sea Elephant, Bleached Winter	60	@	62
Menhaden, Crude, Sound	19	@	22
Menhaden, Crude, Southern	..	@	..
Menhaden, Light Pressed	25	@	26
Menhaden, Bleached W'ter	31	@	32
Menhaden, Extra Bleached	35	@	..
Tallow, City, prime	..	@	45
Tallow, Western, prime	..	@	..
Cocoanut, Ceylon	7	@	7¼
Cocoanut, Cochin	7¾	@	8
Cod, Domestic	31	@	32
Cod, Foreign	33	@	34
Red Elaine	31	@	34
Red Saponified	..	@	4½
Bank, per gal	24	@	..
Straits	25	@	..
Olive, Italian, bbls	81	@	83
Neatsfoot, prime	62½@		75
Palm, prime, Lagos	5¼@		6¼

Mineral Oils.

Black, 29 gravity, 25 @ 30 cold test, per gal	8½@		9
Black, 29 gravity, 15 cold test	9	@	9½
Black, 29 gravity, summer	7	@	8
Cylinder, light, filtered	1	@	20
Cylinder, dark, filtered	14	@	20
Cylinder, dard, st'm refined	10	@	18
Paraffine, 23½ @ 24 gravity	12½@		13
Paraffine, 25 gravity	11½@		12
Paraffine, 28 gravity	10½@		11
Paraffine, red, 21 @ 22 gr'ty	..	@	14½
Paraffine, red, 22½@23 gr'ty	12½@		13

Paints and Colors.

Barytes, Prime White, ₱ ton	$21.00	@	22.50
Barytes, Amer. refined	20.00	@	....
Barytes, Amer. No. 1	18.00	@	....
Barytes, Amer. No. 2	16.00	@	....
Barytes, Amer., off-color	13.00	@	15.00
Blue, Celestial, ₱ ℔	6	@	8
Blue, Chinese	50	@	55
Blue, Prussian	25	@	40
Blue, Ultramarine	10	@	30
Brown, Spanish	½@		1
Brown, Vandyke, Amer.	3	@	3½
Brown, Vandyke, English	6	@	8
Black, American Drop	8	@	10
Black, English Drop	12	@	14
Black, Frankfort, Drop	5	@	18
Black, Lamp, common	12	@	18
Black, Lamp, medium	19	@	25
Black, Lamp, prime	27	@	33
Carmine, No. 40, in bulk	3.10	@	..
Carmine, No. 40, in boxes or barrels	3.20	@	..
Carmine, No. 40, in ounce bottles	4.20	@	..
Chalk, in bulk, ₱ ton	2.00	@	2.40
Chalk, in bbls., ₱ 100 ℔	30	@	35
China Clay, English, ₱ ton	13.50	@	18.00
China Clay, Southern	10.00	@	12.00
Cobalt Oxide, prep'd	2.90	@	....
Cobalt Oxide, black, lots 100 ℔	2.60	@	....
Cobalt, Oxide, black, less 100 ℔	2.65	@	....
Crocus Martus, Engl. ₱ ℔	1½@		2½
Crocus, American	1½@		2½
Green, Paris, in bulk	14	@	14½
Green, Paris, 170 @ 175 ℔ kegs	14½@		15
Green, Paris, small pack	16	@	21
Green, Chrome, ordinary	8	@	13
Green, Chrome, pure	22	@	25
Lead, Eng., B.B. white	9	@	10
Lead, Amn. White, dry, or in oil: Kegs, lots less than 1000 ℔		@	7¼
Kegs, lots 1000 ℔ to 5 tons		@	6¾
Kegs, lots 5 tons to 12 tons		@	6⅝
Kegs, lots 12 tons and over		@	6½
Lead, White, in oil, 25 ℔ tin pails, add to keg price	..	@	½
Lead, White, in oil, 12½ ℔ tin pails, add to keg price	..	@	1
Lead, White, in oil, 1 to 5 ℔ assorted tins, add to keg price	..	@	2½
Lead, Red, bbls. and ½ bbls	6¼	@	7
Lead, Red, kegs	6½	@	7¼
Litharge, kegs	6½	@	7¼
Litharge, bbls. and ½ bbls	6¼	@	7

TERMS, &c.—Lead and Litharge.—On lots of 1000 ℔ or over, 60 days' time or 2½ % discount for cash if paid within 15 days of date of invoice.

Ocher, Rochelle	1.35	@	1½
Ocher, French Washed	1½	@	2½
Ocher, German Washed	1½	@	3
Ocher, American	½	@	1¼
Orange Mineral, English	8½	@	9½
Orange Mineral, French	9	@	9¾
Orange Mineral, German	8½	@	9½
Orange Mineral, American	8	@	8½
Paris White, English Cliffstone	90	@	1.10
Paris White, American	70	@	80
Red, Indian, English	5½	@	7
Red, Indian, American	2	@	6
Red, Turkey	9	@	14
Red, Tuscan	9	@	11
Red, Venetian, American, ₱ 100 ℔	1.00	@	1.35
Red, Venetian, English	1.25	@	1.75
Sienna, Italian, Burnt and Powd. ₱ ℔	5	@	6¼
Sienna, Ital., Burnt Lumps	1½	@	3½
Sienna, Ital., Raw, Powd	5	@	6½
Sienna, Ital., Raw Lumps	2	@	3½
Sienna, American, Raw	1½	@	1¾
Sienna, American, Burnt and Powdered	1½	@	1¾
Talc, French	1¼	@	1¾
Talc, American	1	@	1¼
Terra Alba, Fr'ch, ₱ 100 ℔	72½	@	80
Terra Alba, English	80	@	85
Terra Alba, American No. 1	70	@	75
Terra Alba, American No. 2	38	@	40
Umber, Turkey, Bnt. and Powd., ₱ ℔	3½	@	4
Umber, Turkey Bnt. Ln	2½	@	3
Umber, Turkey, Raw and Powdered	3½	@	..
Umber Turkey, R'w Lmps	2½	@	2¾
Umber, Turkey, Bnt. Amer.	1¼	@	1¾
Umber, Turkey, R'w Amer.	1¼	@	1¾
Yellow, Chrome	10	@	25
Vermilion, Americ. Lead	11½	@	13
Vermilion, Quicks'er, bulk	..	@	75
Vermilion, Quicks'er, bags	..	@	76
Vermilion, Quicksilver, smaller pkgs	..	@	80
Vermilion, English Import	85	@	..
Vermilion, Imitation, Eng	8	@	25
Vermilion, Trieste	87½	@	90
Vermilion, Chinese	90	@	95
Whiting, Common, ₱ 100 ℔	40	@	45
Whiting, Gilders'	50	@	55
Zinc, American, dry, ₱ ℔	4	@	4¾
Zinc, French, Red Seal	..	@	8½
Zinc, French, Green Seal	..	@	8¾
Zinc, French, V. M. X	..	@	7
Zinc, Antwerp, Red Seal	..	@	7¾
Zinc, Antwerp, Green Seal	..	@	8¼
Zinc, German, L. Z. O	..	@	6¾
Zinc, V M. in Poppy Oil, G. Seal, lots of 1 ton and over	10¾	@	11¼
lots less than 1 ton	11	@	11¾
Zinc, V. M. in Poppy Oil, Red Seal	..	@	..
lots of 1 ton and over	10	@	10¼
Lots of less than 1 ton	10¼	@	10¾

DISCOUNTS.—French Zinc.—Discounts to buyers of 10- bbl. lots of one or assorted grades. 1 %; 25 bbls, 2 %, 50 bbls, 4 %. No discount allowed on less than bbl. lots.

Colors in Oil.

Blue, Chinese, ₱ ℔	35	@	40
Blue, Prussian	29	@	45
Blue, Ultramarine	12	@	18
Brown, Vandyke	7	@	12
Green, Chrome	8	@	13
Green, Paris	16	@	18½
Sienna, Raw	7	@	13
Sienna, Burnt	7	@	13
Umber Raw	7	@	10
Umber, Burnt	7	@	10

Glue.

Low Grade, ₱ ℔	8	@	10
Cabinet	12	@	14
Medium White	13	@	15
Extra White	17	@	20
French	10	@	22½
English	10	@	15
Irish	12	@	15

CURRENT METAL PRICES.

SEPTEMBER 17, 1890.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

IRON AND STEEL.

Bar Iron from Store.

Common Iron: ¾ to 2 in. round and square.. 1 to 6 in. x ⅜ to 1 in.....	₩ lb 2.00 @ 2.10¢
Refined Iron: ¾ to 2 in. round and square.. 1 to 4 in. x ⅜ to 1½ in..... 4½ to 6 in. x ⅜ to 1 in	₩ lb 2.10 @ 2.30¢
1 to 6 in. x ¼ and 5-16	₩ lb 2.30 @ 2.50¢
Rods—⅜ and 11-16 round and sq..	₩ lb 2.20 @ 2.40¢
Bands—1 to 6 x 3-16 to No. 12.....	₩ lb 2.40 @ 2.60¢
"Burden Best" Iron, base price..	₩ lb 2.90 @ ....¢
Burden's "H. B. & S." Iron, base price.....	₩ lb 2.70 @ ....¢
"Ulster".....	₩ lb 2.90 @ ....¢
Norway Bars	3.90 @ ....¢
Norway Shapes	4.90 @ ...¢

Merchant Steel from Store.

	Per pound.
Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots.....	2¾¢
Best Cast Steel, base price in small lots	8 ¢
Best Cast Steel Machinery, base price in small lots.....	5¢

Sheet Iron from Store.

	Common American.	R. G. Cleaned.
10 to 16.....₩ lb	3.00 @ 3.00¢	3.50 @ .....¢
17 to 20 .....₩ lb	3.25 @ 3.25¢	3.50 @ 3.75 ¢
21 to 24.....₩ lb	3.35 @ 3.35¢	3.75 @ .....¢
25 and 26....₩ lb	3.45 @	3.75 @ .....¢
27..... ...₩ lb	3.55 @ 3.63½¢	4.00 @ .....¢
28.....₩ lb	3.75 @ .. ..¢	4.25 @ .....¢

	B. B.	2d qual.
Galv'd, 14 to 20, ₩ lb,	5.00 @ ...	4.75½ @ .....¢
Galv'd, 21 to 24, ₩ lb,	5.37½ @ ...	5.12½ @ .....¢
Galv'd, 25 to 26, ₩ lb,	5.75 @ ...	5.50 @ .....¢
Galv'd, 27..... ₩ lb,	6.12½ @ ...	5.85½ @ .....¢
Galv'd, 28.. ₩ lb,	6.50 @ ...	6.23 @ .....¢

	A	B, 9¢
Patent Planished..... .....₩ lb	10¢	@ 10¢
Russia..... ....₩ lb	9½¢	@ 10¢
American Cold Rolled B. B..... ....₩ lb	5¢	@ 7¢
Craig Polished Sheet Steel.....₩ lb,	8½¢	

English Steel from Store.

Best Cast .....₩ lb	15 ¢
Extra Cast ....₩ lb	16½ @ 17 ¢
Swaged, Cast..... ....₩ lb	16 ¢
Best Double Shear..... .....₩ lb	15 ¢
Blister, 1st quality..... .....₩ lb	12 ¢
German Steel, Best..... .....₩ lb	10 ¢
2d quality. ....₩ lb	9 ¢
3d quality .....₩ lb	8 ¢
Sheet Cast Steel, 1st quality.....₩ lb	15 ¢
2d quality.....₩ lb	14 ¢
3d quality..... .....₩ lb	12½¢
R. Mushet's "Special" .....₩ lb	45 ¢
" " "Titanic".....₩ lb	20 ¢

METALS.

Tin.

	Per lb
Banca, Pigs.....	23½¢
Straits, Pigs.....	23¼¢
Straits in Bars	25 ¢

Tin Plates.

	Charcoal Plates.—Bright.		Per box.
Melyn Grade.....	IC, 10 x 14..	@	$6.25
" "	... .IC, 12 x 12..	@	6.50
" "	. .... IC, 14 x 20..	@	6.25
" "	.....IC, 20 x 28..	@	12.75
" "	....IX, 10 x 14.. ...	@	7.75
" "	....IX, 12 x 12..	@	8.00
" "	....IX, 14 x 20..	@	7.75
" "	.....IX, 20 x 28..	@	15.50
" "	.....DC, 12½ x 17..	@	5.75
" "	.....DX, 12½ x 17..	@	7.25
Galland Grade.....	IC, 10 x 14..	@	6.25
" "	.....IC, 12 x 12..	@	6.50
" "	.....IC, 14 x 20.. ..	@	6.15
" "	.....IX, 10 x 14.. .. .	@	7.40
" "	. .....IX, 12 x 12..	@	7.65
" "	.....IX 14 x 20..	@	7.40
Allaway Grade.....	IC, 10 x 14..	@	5.50
" "	.. ...IC, 12 x 12..	@	5.65
" "	.....IC, 14 x 20..	@	5.50
" "	.....IC, 20 x 28..	@	11.00
" "	.....IX, 10 x 14..	@	6.67
" "	. .....IX, 12 x 12..	@	6.80
" "	..... IX, 14 x 20..	@	6.65
" "	.....IX, 20 x 28..	@	13.50
" "	...DC, 12½ x 17.. ...	@	5.15
" "	. .DX, 12½ x 17.. 6.00	@	6.15

	Coke Plates.—Bright.		
Steel Coke.—IC, 10 x 14, 14 x 20,.	....	@	$5.12½
10 x 20..	....	@	7.25
20 x 28..	...	@	10.25
IX, 10 x 14, 14 x 20..	....	@	6.00
BV Grade.—IC, 10 x 14, 14 x 20..	....	@	5.12½

	Charcoal Plates.—Terne.		
Dean Grade.—IC, 14 x 20..	....	@	$5.10
20 x 28.	.. .	@	10.20
IX, 14 x 20..... .	....	@	5.90
20 x 28.....	....	@	11.80
Abecarne Grade. –IC, 14 x 20...	....	@	4.95
20 x 28....	....	@	9.97
IX, 14 x 20....	...	@	5.90
20 x 28..	....	@	11.80

Tin Boiler Plates.

I CX, 14 x 26.....112 sheets.....	$13.00	@ $13.00
I CX, 14 x 28.....112 sheets....	....	@ 13 25
I XX, 14 x 31... ....112 sheets		@ 14.75

Copper.

Duty: Pig, Bar and Ingot, 4¢; Old Copper, 3¢ ₩ lb. Manufactured (including all articles of which Copper is a component of chief value), 35 ¢ ad valorem

Ingot.

Lake	@ 17½¢
Baltimore Grade....	@ 15 ¢

Sheet and Bolt.

Prices adopted by the Association of Copper Manufacturers of the United States, June 27, 1890, being quotations for all sized lots.

Not wider than	Not longer than	And longer than	Weights per square foot and prices per pound. Over 64 oz.	32 to 64 oz.	16 to 32 oz.	14 to 16 oz.	12 to 14 oz.	10 to 12 oz.	8 to 10 oz.	Less than 8 oz.
30	72		25	25	25	26	27	28	31	33
30	72		25	25	25	26	28	30	34	...
36	96		25	25	25	27	29	33	36	...
36	96		25	25	26	28	30	34	38	....
48	96		25	25	27	29	31	35	....	....
48	96		25	25	28	30	32	36	....	....
60	96		25	25	30	32	37	....	....	..
60	96		25	26	31	....	....	....	....	....
84	96		26	27	....	....	....	....	....	....
84	96		27	28	....	....	....	....	....	....
Over 84 in. wide			28	30	....	....	....	....	....	....

All Bath Tub Sheets.....	13 oz.	14 oz.	12 oz.	10 oz.
Per pound....	$0.27	0.29	0 31	0.35

Bolt Copper, ⅜ inch diameter and over, per pound..... ...25¢

Circles, 60 inches in diameter and less, 3 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Circles, over 60 inches diameter, up to 96 inches diameter, inclusive, 5 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Circles, over 96 inches diameter, 6 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Segment and Pattern Sheets, 3 cents per pound advance over price of sheets required to cut them from.

Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, 1 cent per pound over the foregoing prices.

Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, 2 cents per pound over the foregoing prices.

Copper Bottoms, Pits and Flats.

	Per pound.
14 ounce to square foot and heavier.....	29¢
12 ounce and up to 14 ounce to square foot....	30¢
10 ounce and up to 12 ounce.....	32¢

Circles less than 8 inches diameter 5 cents per pound additional.

Circles over 13 inches diameter are not classed as Copper Bottoms.

Tinning.

Tinning sheets on one side, 10, 12 and 14 x 48 each.....	8¢
Tinning sheets on one side, 30 x 60 each	30¢
For tinning boiler sizes, 9 in. (sheets 14 in. x 60 in.), each.	15¢
For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each	12¢
For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.) each.....	12¢
Tinning sheets on one side, other sizes, per square foot.....	2½¢
For tinning both sides double the above prices.	

Planished Brass and Copper.

14 x 48.

14 and 16 oz. and heavier..31¢. By the case...30¢ ₩ lb
12 oz. and lighter.....33¢. By the case...32¢ ₩ lb

24 x 48 and 30 x 60.

14 and 16 oz. and heavier..44¢. 12 oz.....37¢ ₩ lb

Seamless Brass and Copper Tubes.

O. G.	N. G.	⅜	⅓	⅝	¾	⅞	1	1⅛
8-14	6-12	39	35	32	31	30	29	26
15	13	40	35	33	32	31	30	27
16	14	41	36	34	33	32	31	27
17	15	42	37	35	32	33	32	28
18	16	44	38	36	34	33	32	29
19	17	45	39	37	36	35	34	31
20	18-19	46	41	39	38	37	36	33
21	20	48	43	41	40	39	38	36
22	21	50	44	42	41	40	39	38
23	22	52	46	44	43	42	41	41
24	23	55	48	45	45	44	42	43
25	24	58	51	48	47	46	45	47

Copper Bronze and Gilding Tube, 3¢ ₩ lb additional.

Brazed Brass Tubing. (To No. 20, inclusive.

Above 5-16 inch to 3 inch, inclusive	35¢
Plain, above 3 inch.....	45¢
Plain, 5-16 inch.....	45¢
Plain, ¼ inch.....	60¢
Plain, 3-16 inch.....	60¢
Plain, ⅛ inch.....	$1.00
Fancy Tubing, Brass, to No. 20, inclusive.....	1.50
bronze Tubing, 3¢ ₩ lb more than Brass.	
Discount from list.....	25 @ ... ⅓

Roll and Sheet Brass.

Discount from list..... .....20 ⅓

High Brass Rods.

Over 1 inch diameter.. .. ..32¢	
¼ inch to 1 inch diameter, both inclusive.....36¢	
No. 8 and less than ¼ inch diameter.....28¢	
Smaller than No. 8..... ....33¢	

Hexagon, Octagon and Square, 2¢ ₩ lb advance over Round Rods.

Spelter.

Duty: Pig, Bars and Plates, $1.50 ₩ 100 lb.

Western Spelter .. ..6¼¢	
"Bertha" . ...8¢	

Zinc.

Duty; Sheet, 2½¢ ₩ lb.

600 lb casks..... .....6¼¢	
Per lb ....7¼¢	

Lead.

Duty: Pig, $2 ₩ 100 lb. Old Lead, 2¢ ₩ lb. Pipe and Sheets, 3¢ ₩ lb.

American ....3⅜¢	
Bar..... .....6 ¢	
Pipe, subject to trade discount.... .....7 ⅓	
Tin-Lined Pipe, subject to trade discount.... ..15¢	
Block Tin Pipes, subject to trade discount.....40¢	
Sheet, subject to trade discount..... .....7¾¢	

Solder.

½ @ ½ (Guaranteed)... ....15½¢	
No. 1..... ....13½¢	
Extra Wiping..... .....11¼¢ @ 12½¢	

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony.

Cookson..... ....₩ lb 24 ¢	
Hallett's. .... " 21½¢	

ALUMINUM.

Prices in Ingots.

$2.00 ₩ lb in lots of 1000 lb and over.
$2.25 ₩ lb in lots of 500 lb and over.
$2.50 ₩ lb in lots of 100 lb and over.

Prices Per Pound on Rolled Sheets.

(Brown & Sharpe, Standard Gauge.)

Wider than. ..... And including.....	2 in. 10 in.	10 in. 14 in.	14 in. 18 in.	18 in. 22 in.	22 in. 24 in.
Up to No. 20 inclusive...	$2.50	$2.60	$2.80	$3.00	$3.20
Nos. 21, 22, 23 and 24....	2.60	2.70	2.90	3 10	3.30
Nos. 25 and 26.....	2.70	2.80	3.00	3.20	3.40
Nos. 27 and 28.....	2.80	2.90	3.10	3.30	3.50

Sheets, thinner than No. 28 gauge and wider than 24 inches, special prices not less than $5 per pound.
Add 35 cents per pound for sheets cut to particular widths and lengths.
Sheets rolled to .001 in. and under, 50 cents per ounce.
Leaf in books, 20 cents per book; $2 per pack of 10 books, sheets 5 x 5 inches.

Aluminum Tubing.

From $4 per pound upward, according to size and thickness of walls.

Aluminum Castings.

From 50 cents upwards per pound extra over the cost of the metal in ingots, according to the number wanted, weight, the difficulty of casting, cost of patterns, &c.

Aluminum Wire in Coils.

(Brown & Sharpe, Standard Gauge.)

	Per lb
All numbers up to No. 14 (.064 in.) inclusive.....	$3.00
Nos. 15 (.05706 in.) to 22 (.02534 in.) inclusive....	3.25
Nos. 23 (.02571 in.) and 24 (.0201 in.) inclusive...	3.50
Nos. 25 (.0179 in.) and 26 (.01594 in.) inclusive....	3.75
Nos. 27 (.014195 in.) and 28 (.012641 in.) inclusive	4.00
Nos. 29 (.011257 in.) and 30 (.010023 in.) inclusive	4.25
No. 31 (.008928 in.).....	4.50
No. 32 (.00795 in.).....	4.75
No. 33 (.00708 in.).....	5.00
No. 34 (.00630 in.).....	5.25
No. 35 (.00561 in.).....	5.75
No. 36 (.00500 in.).....	6.25
No. 37 (.00445 in.).....	7.00
No. 38 (.003965 in.).....	8.50
No. 39 (.003531 in.).....	12.00
No. 40 (.003144 in.).....	16.00

Spooling, on 1-pound spools, 15 cents per pound extra.
Spooling, on 10-pound spools, 5 cents per pound extra.